



BCM450 Troubleshooting Guide

BCM450

Business Communications Manager

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Chapter 1

Introduction

The Nortel Business Communications Manager 450 (BCM450) provides private network and telephony management capability to small and medium-sized businesses. The BCM450 system integrates voice and data capabilities, and IP Telephony gateway functions into a single telephony system. It also enables you to create and provide telephony applications for use in a business environment.

Purpose

This guide provides procedural information to help you troubleshoot and isolate problems in your BCM450 network.

Audience

The *BCM450 Troubleshooting Guide* is for use by network administrators responsible for maintaining BCM networks that include BCM450 devices. This guide is also useful for network operations center (NOC) personnel supporting a BCM450 managed services solution. To use this guide, you must:

- be an authorized BCM450 administrator within your organization
- know basic Nortel BCM450 terminology
- be knowledgeable about telephony and IP networking technology

Organization

This guide is organized for easy access to information that explains the troubleshooting procedures associated with using the BCM450 system. This guide contains information on the following topics:

- [Initial Troubleshooting](#) on page 15
- [Hardware Troubleshooting](#) on page 19
- [Software Troubleshooting](#) on page 37
- [Advanced Troubleshooting](#) on page 51
- [Recovery trees](#) on page 69
- [Downloading Software](#) on page 75
- [Troubleshooting Tools](#) on page 79
- [Understanding system messages](#) on page 83
- [Useful Troubleshooting Links](#) on page 85
- [Frequently Asked Questions](#) on page 87

- [Contacting Technical Support](#) on page 99

Acronyms

The following is a list of acronyms used in this guide.

Table 1 List of acronyms

Acronym	Description
AIS	Alarm Indication Signal
BCM	Business Communications Manager
BFT	Base Function Tray
BRI	Basic Rate Interface
CbC	Call by Call
CDR	Call Detail Recording
CFA	Carrier Failure Alarms
CIF	Chassis Interface Card
CLID	Calling Line Identification
CPE	Customer Premises Equipment
CSU	Channel Service Unit
DHCP	Dynamic Host Configuration Protocol
DN	Directory Number
DNS	Domain Name Server
DNIS	Dialed Number Identification Service
DTM	Digital Trunk Module
ES	Errored Seconds
HTTP	Hypertext Transfer Protocol
IP	Internet Protocol
ISDN	Integrated Switched Digital Network
LAN	Local Area Network
MBM	Media Bay Module
MIB	Management Information Base
MGS	Media Gateway Server
MOS	Mean Opinion Score
MPS	Media Path Server
NAT	Network Address Translation
NCM	Network Configuration Manager
NOC	Network Operations Center
NTP	Network Time Protocol

Table 1 List of acronyms

Acronym	Description
OOF	Out of Frame
PPP	Point-to-Point Protocol
PRI	Primary Rate Interface
PBX	Private Branch Exchange
PSTN	Public Switched Telephone Network
PVQM	Proactive Voice Quality Monitoring
QoS	Quality of Service
RAI	Remote Alarm Indication
RTP	Real-time Transport Protocol
SFTP	Secure File Transfer Protocol
SNMP	Simple Network Management Protocol
SSH	Secure Shell
SSL	Secure Socket Layer
UAS	Unavailable Seconds
UPS	Uninterruptable Power Supply
USB	Universal Serial Bus
VoIP	Voice over Internet Protocol
VLAN	Virtual Local Area Network
WAN	Wide Area Network

Symbols and conventions used in this guide

These symbols are used to highlight critical information for the BCM450 system:



Caution: Alerts you to conditions where you can damage the equipment.



Danger: Alerts you to conditions where you can get an electrical shock.



Warning: Alerts you to conditions where you can cause the system to fail or work improperly.



Note: A Note alerts you to important information.



Tip: Alerts you to additional information that can help you perform a task.



Security note: Indicates a point of system security where a default should be changed, or where the administrator needs to make a decision about the level of security required for the system.



Warning: Alerts you to ground yourself with an antistatic grounding strap before performing the maintenance procedure.



Warning: Alerts you to remove the BCM450 main unit and expansion unit power cords from the ac outlet before performing any maintenance procedure.

Related publications

Related publications are listed below. To locate specific information, you can refer to the *Master Index of BCM450 Library* (NN40020-100).

BCM450 Administration and Security Guide (NN40160-601)

BCM450 Installation Guide—System (NN40160-301)

BCM450 Maintenance Guide (NN40160-503)

Keycode Installation Guide (NN40010-301)

BCM450 Configuration Guide—Devices (NN40160-500)

BCM450 Configuration Guide—System (NN40160-501)

BCM450 Telset Administration Guide (NN40020-604)

CallPilot Telephone Administration Guide (NN40090-500)

CallPilot Contact Center Telephone Administration Guide (NN40040-600)

Reporting for Contact Center Troubleshooting

Chapter 2

Initial Troubleshooting

You can better troubleshoot the problems on your network and reduce their impact by preparing for such events in advance. To do this, you must know the following:

- that your system is properly installed and routinely maintained
- the configuration of your network
- the normal behavior of your network

Navigation

- [Proper installation and routine maintenance](#) on page 15
- [Network configuration](#) on page 15
- [Normal behavior on your network](#) on page 16

Proper installation and routine maintenance

See the *BCM450 Installation Guide—System* (NN40160-301) for detailed installation information. This document also outlines the routine tasks required for operating the BCM450.

Network configuration

To keep track of your network's configuration, gather the information described in the following sections. This information, when kept up-to-date, is extremely helpful when you experience network or device problems.

- [Site network map](#) on page 15
- [Logical connections](#) on page 16
- [Device configuration information](#) on page 16
- [Other important data about your network](#) on page 16

Site network map

A site network map identifies where each device is physically located on your site, which helps locate the users and applications that are affected by a problem. You can use the site network map to systematically search each part of your network for problems.

Logical connections

You must know how your devices are connected logically as well as physically. For example, while virtual LANs (VLANs) are not supported on the BCM450 system, VLANs may exist between IP sets connected to the BCM450.

Device configuration information

You should maintain online and paper copies of your device configuration information. Ensure that all online data is stored with your site's regular data backup. If your site does not have a backup system, copy the information onto a backup disk (such as a CD or zip disk) and store the backup disk at an offsite location.

Other important data about your network

For a complete picture of your network, have the following information available:

- **All passwords**—Store passwords in a safe place. It is a good practice to keep records of your previous passwords in case you must restore a device to a previous software version and need to use the old password that was valid for that version.
- **Device inventory**—It is a good practice to maintain a device inventory, which list all devices and relevant information for your network. The inventory allows you to easily see the device type, IP address, ports, MAC addresses, and attached devices.
- **MAC address-to-port number list**—If your hubs or switches are not managed, you must keep a list of the MAC addresses that correlate to the ports on your hubs and switches.
- **Change control**—Maintain a change control system for all critical systems. Permanently store change control records.
- **Contact details**—It is a good practice to store the details of all support contracts, support numbers, engineer details, and telephone and fax numbers. Having this information available when troubleshooting can save a lot to time.

Normal behavior on your network

When you are familiar with the performance of your network when it is fully operational, you can be more effective at troubleshooting problems that arise. To understand the normal behavior of your network, monitor your network over a long period of time. During this time you can see a pattern in the traffic flow, such as which devices are typically accessed or when peak usage times occur.

To identify problems, you can use a baseline analysis, which is an important indicator of overall network health. A baseline serves as a useful reference of network traffic during normal operation, which you can then compare to captured network traffic while you troubleshoot network problems. A baseline analysis speeds the process of isolating network problems. By running tests on a healthy network, you compile normal data for your network. This normal data can then be

used to compare against the results that you get when your network is experiencing trouble. For example, ping each node to discover how long it typically takes to receive a response from devices on your network. Capture and save each device's response time and when you are troubleshooting you can use these baseline response times to help you troubleshoot.

Chapter 3

Hardware Troubleshooting

Use the tasks in this chapter to troubleshoot problems related to the BCM450 hardware components.

Navigation

- [Troubleshooting the BCM450 hardware](#) on page 19
- [Power on self test](#) on page 27
- [Testing basic hardware functionality](#) on page 28
- [Monitoring the boot process](#) on page 34

Troubleshooting the BCM450 hardware

Complete the following tasks, in the order shown below, to troubleshoot some of the common problems that you may encounter with the BCM450 hardware:

- [Check the power source](#) on page 19
- [Check LED indicators](#) on page 19
- [Check the wiring connections](#) on page 24
- [Verify the keycodes](#) on page 24
- [Restart or shut down the system](#) on page 25

Check the power source

Begin troubleshooting the hardware by checking the power source:

- check the connection between the power supply and the main unit
- check the connection from the power supply to the electrical outlet

Check LED indicators

After checking the power source, check the LED indicators. This section describes the operation of the BCM450 system LEDs:

- [System status LEDs](#) on page 20
- [LAN port LEDs](#) on page 21
- [Media bay module LEDs \(expansion units only\)](#) on page 21
- [DTM LEDs](#) on page 22
- [BRIM LEDs](#) on page 24

System status LEDs

The chassis of the BCM450 contains two LEDs: a Status LED and a Power LED. The Power LED is located at the bottom left of the chassis; the Status LED is immediately above it. The table [System status LEDs states and descriptions](#) on page 20 describes the meaning of the system status LEDs in the following situations:

- start-up sequence: LED indicators during the normal start-up process
- safe-mode start-up sequence: LED indicators during a safe-mode start-up
- shutdown sequence: LED indicators during a shutdown or failure
- start-up profile sequence: LED indicators during an initial installation or staging

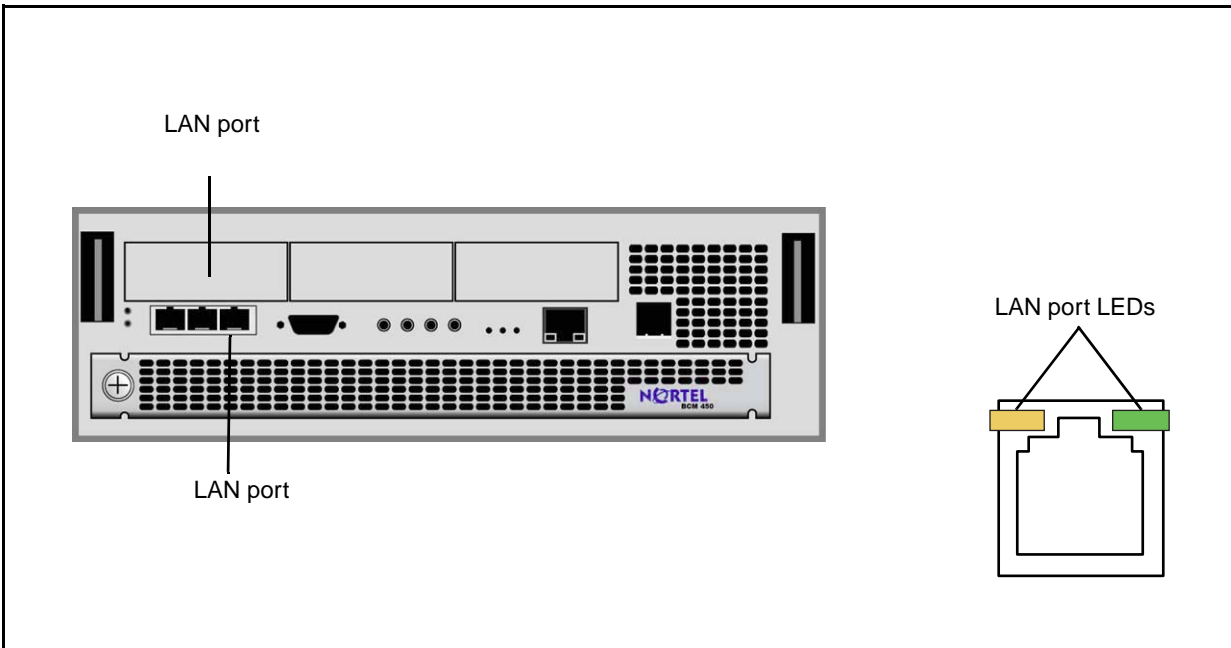
Table 1 System status LEDs states and descriptions

① Power	② Status	Description
Start-up sequence		
Solid yellow	Solid yellow	Power applied to the system.
Solid yellow	Off	Power on self test (POST); 9 seconds.
Solid yellow	Solid yellow	System initialization; 14 seconds.
Solid green	Solid yellow	Kernel initialization; 8 seconds.
Solid green	Flashing green	Services initialization; 1 minute.
Solid green	Solid green	System running; normal operation.
Solid green	Solid red	Services initialization failure
Safe mode start-up sequence		
Solid red	Solid green	System running with manufacturing settings enabled
Solid red	Solid red	System running in software reset mode
Solid red	Flashing yellow	System running in configuration reset mode
Shutdown sequence or failure		
Solid green	Flashing yellow	Shutdown in progress
Off	Solid yellow	Shutdown completed
Solid red	Flashing yellow	Overheating detected; thermal shutdown completed
Solid red	Solid red	Power spike or rail power fluctuation detected
Flashing red	Solid red	Rail power fluctuation; power monitor shutdown completed
Solid yellow	Solid red	Power spike shutdown completed
Off	Off	No power; system is shut down
Start-up profile sequence		
Flashing yellow	Flashing yellow	Start-up profile executing
Flashing green	Flashing green	Start-up profile completed (USB device can be removed)
Solid green	Solid green	Start-up profile successfully applied
Solid green	Solid red	Start-up profile failure

LAN port LEDs

Each LAN port on the main unit and expansion unit has two LEDs. These LEDs indicate the status of the connection for that LAN port. The figure [LAN port LED locations](#) on page 21 shows the location of these LEDs on the main unit.

Figure 1 LAN port LED locations



The table [LAN port and expansion port LED indicators](#) on page 21 describes the possible LED states for the LAN ports LEDs.

Table 2 LAN port and expansion port LED indicators

LED	Status	Description
Yellow (left LED)	On	The LAN port is operating at 10 Mb/s.
Green (right LED)	On	The LAN port is operating at 100 Mb/s.
Both LEDs	Off	No connection.
Any LED	Flashing	The LAN port is sending or receiving network data. The frequency of the flashes increases with increased traffic.

Media bay module LEDs (expansion units only)



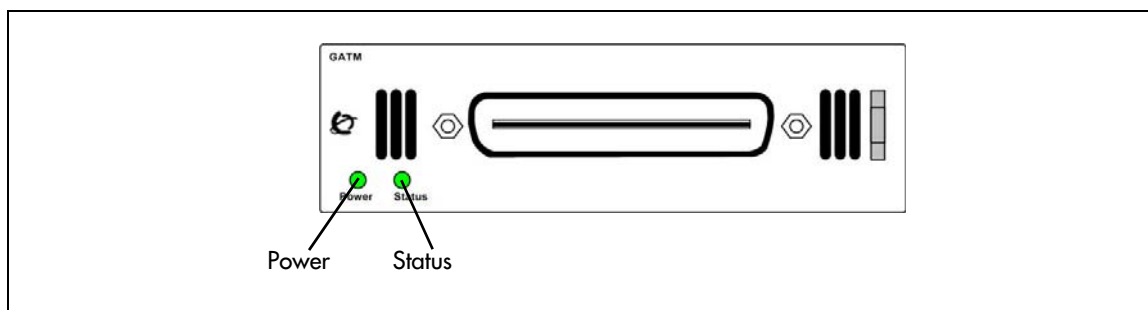
The two media bay module (MBM) LEDs on an expansion unit show the power and status of the MBM. The figure [MBM LEDs](#) on page 22 shows the location of the  (Power) and  (Status) LEDs on an MBM. The power and status LEDs are in the same location on all MBMs.

Figure 2 MBM LEDs

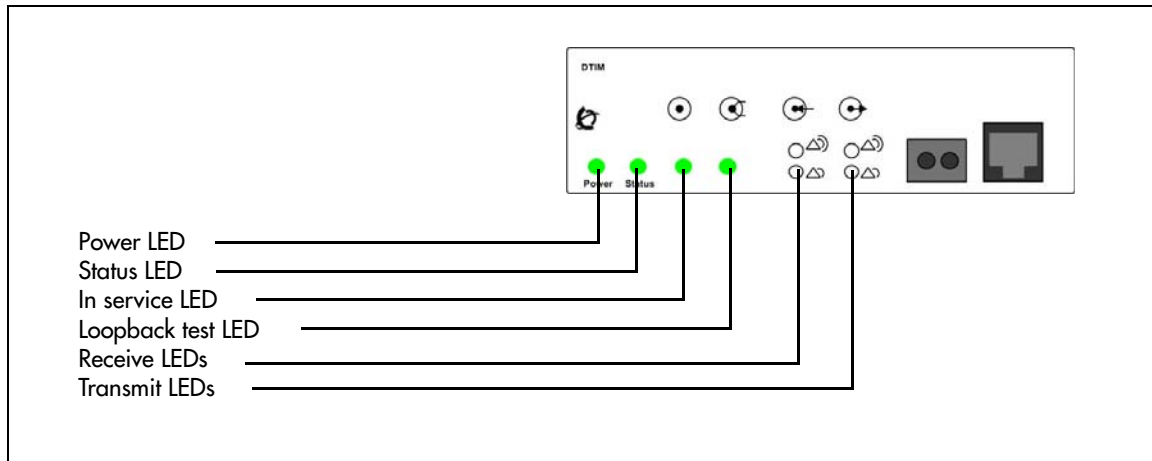
The table [MBM LED descriptions](#) on page 22 describes the possible MBM LED states.

Table 3 MBM LED descriptions

Power	Status	Description
Off	Off	The MBM has no power, or a failure occurred on the MBM power converter.
On	Off	BCM450 to expansion unit failure or system initialization.
On	Blinking	Hardware is working, but an operational problem exists such as: <ul style="list-style-type: none"> no link to the main unit is detected frame alignment is lost on messages from the main unit bandwidth not allocated MBM is in maintenance state MBM is in download state (GASM, GATM4/GATM8)
Blinking	Blinking	The MBM has power, but a hardware problem exists such as: <ul style="list-style-type: none"> partial failure of power converter thermal overload fan failure
On	On	The MBM is ready to operate.

DTM LEDs

The DTM has additional LEDs that are not on most other MBMs. The figure [DTM LEDs](#) on page 23 shows the location of the DTM LEDs.

Figure 3 DTM LEDs

The table [DTM LED functions](#) on page 23 describes the functions of the DTM LEDs.

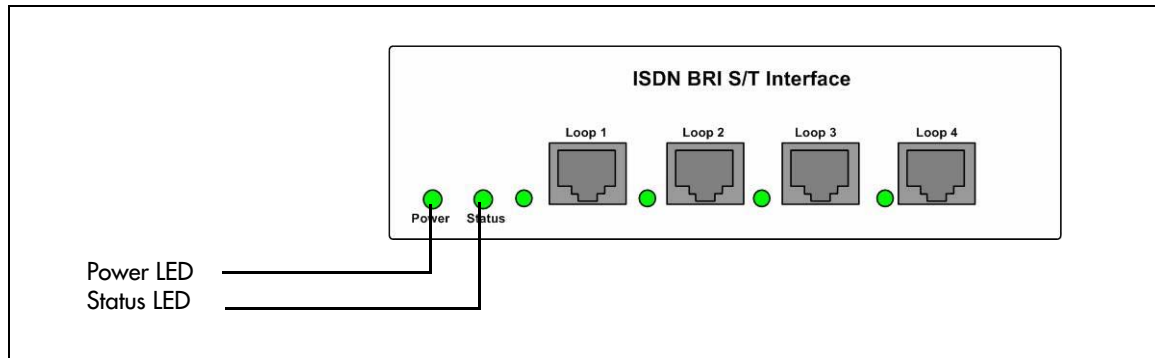
Table 4 DTM LED functions

LED	Status	Descriptions
Power	—	See “Media bay module LEDs (expansion units only)” for details.
Status	—	See “Media bay module LEDs (expansion units only)” for details.
In service	Flashing	The T1, ETSI, or PRI trunks are out of service because a loopback test is running or the DTM is initializing.
Loopback test	On	A continuity loopback test is running.
Receive alarm	On	A problem with the received digital transmission. This half-duplex link does not work.
Receive error	On	A small error as a result of degraded digital transmission. Possible causes are an ohmic connection, water ingress, or too long a loop.
Transmit alarm	On	The DTM cannot transmit. The DTM sends an alarm indication signal (AIS) to the terminating switch. This half-duplex link does not work.
Transmit error	On	The DTM is sending a remote alarm indication (RAI) carrier failure alarm (CFA) to the terminating switch. If the transmit alarm is not on, this error indicates a far-end or cable problem.
All LEDs	Flashing	The DTM is initializing.

BRIM LEDs

The BRIM has one additional LED beside each RJ-48C jack. These LEDs are on when the ISDN line is active. The figure [BRIM LEDs](#) on page 24 shows the location of the LEDs on a BRIM.

Figure 4 BRIM LEDs



For more information on the power and status LED functions, see [Media bay module LEDs \(expansion units only\)](#) on page 21.

Check the wiring connections

After you check the power source and the LEDs, begin to check the wiring. Check the connections between the following components:

- the expansion unit and the main unit
- the main unit and to the MBMs—make sure that the cables are properly seated and are connected to the correct ports
- the power supply and the AC power outlet
- if you are using a UPS, check the connection from:
 - the USB port on the BCM450 to the USB port on the UPC
 - the UPS and the electrical outlet
 - the connection from the power supply to both the UPS and the BCM450 main unit
- the lines and extensions connected through the RJ-21 telephony connector
- the auxiliary equipment—connections at the auxiliary terminal block, or at the patch panel

Verify the keycodes

If a specific feature is not functioning, verify that the feature is included in your installed keycodes. This section provides procedure for verifying the installed keycodes using either Element Manager or Telset. For more detailed information about retrieving and entering the keycode for your system, see the *Keycode Installation Guide* (NN40010-301).

To verify the keycodes using Element Manager

- 1 In the **Task Navigation Panel**, select the **Configuration** tab.

- 2 Select the **System** folder and click the **Keycodes** task.
The Keycodes panel displays and the installed features appear in the Keycodes list.
- 3 To enter a new keycode, click **Load File**.
- 4 Browse to where you saved the keycode file you downloaded from KRS.
- 5 Click **Open**.
The file uploads and the feature appears in the Keycodes list.

To verify the keycodes using Telset

- 1 Select Feature 9*8 from a two-line display telephone.
- 2 Enter the following user ID and password:
User ID: **SETNNA**
Password: **CONFIG**

The numerical values of the user ID and password are 738662 and 266344, respectively.
- 3 Press **NEXT** to scroll through the menu and select **Feature Codes**.
- 4 Press **OK**.

The system ID (SID) displays.
- 5 Press **NEXT**.
- 6 Enter your sequence ID.
- 7 Press **NEXT** to scroll through the list and perform one or both of the following tasks:
 - a To activate features, select **Feature List**.
 - Press **SHOW** to view the available features.
 - Use the soft keys to activate features for your system.
 - b To enter a new keycode, select **Entitlement Code**.
 - Press **SHOW** to view the current keycode.
 - Use the soft keys to modify the keycode for your system.

Restart or shut down the system

You can use the Reset utility in Element Manager to:

- reboot the BCM450 system
- perform a warm reset of telephony services
- perform a cold reset of telephony services
- shut down the system

Use this procedure to restart the system.

To restart the system

Use this procedure to restart the system from the Element Manager.

- 1 Select **Administration > Utilities > Reset**.
- 2 Click the appropriate reset button.

Table 5 lists the Reset functions.

Table 5 Reset functions

Function	Description	Impact
Reboot BCM450 System	Restarts the operating system of the BCM450 system	Temporarily stops all services on the system. Restarts all services. This operation does not affect configuration parameters or programming.
Warm Reset Telephony Services	Restarts telephony services running on the BCM450 system	Restarts all telephony services, including LAN CTE, Voicemail, and IP telephony. This operation does not affect configuration parameters or programming.
Cold Reset Telephony Services	Resets telephony programming of the BCM450 system to the factory defaults for that software level	Affects all telephony services, including LAN CTE, Voicemail, and IP telephony. Telephony services restart with all telephony programming at default values for the specified region, template, and start DN, for the current software release level. A cold reset erases voice message mailboxes and messages if the DN length is not set to system defaults. For information about setting the DN length, refer to the <i>BCM450 Device Configuration Guide</i> .
Shutdown BCM System	Shuts down the BCM450.	Stops all services running on the system.

To restart the system from the BCM450 hardware, use the reset button as described in [Hardware reset functions](#) on page 27.

Table 6 Hardware reset functions

Function	Description	Impact
Press the Reset button on the BCM450 system	Shuts down and reboots the BCM450 system	Stops all services and restarts the system. This operation does not affect configuration parameters or programming.
Press and hold the Reset button on the BCM450 system for 5 seconds	Immediately shuts down the BCM450 system	Immediately stops and restarts the operating system. This operation does not affect configuration parameters or programming, but can result in data loss. Use only if the BCM450 system is non-responsive.

Note: When you restart the BCM450 system using the Reset button, the system will wait for 10 seconds for a user to log into the Maintenance CLI. If a user does not log in during that time period, the BCM450 will reboot to the Main OS.

Power on self test

The power on self test (POST) feature tests basic hardware functionality when the BCM450 system powers up, and stores the results in a log file. You can view the log file for hardware failures.

Viewing the POST log file

- 1 Use Element Manager to transfer the log files to your PC. Refer to the “BCM450 Log management” chapter in the *BCM450 Administration and Security Guide* (NN40160-601) for information about how to transfer log files.
- 2 View the bootloader.log file.
- 3 Check the log file for errors. [Figure 5 on page 28](#) shows a bootloader.log file with no errors; [Figure 6 on page 28](#) shows a file with errors.

Figure 5 Example: Bootloader.log file with no errors

```
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:09 2008-07-16
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:09 Interface initialized
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:10 RAM detected
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:10 Flash detected
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:14 Reboot Reason: Software Reboot
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:14 Ethernet MAC Address found
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:14 PCI Bus initialized
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:14 Network initialized
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:14 Hard Drive tested
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:22 System initialized
2008-07-16T13:24:45.456 [INFO ] {BootLoader} (18000) - 13:23:27 usb reset;run bcmboot
2008-07-16T13:24:46.653 [INFO ] {BootLoader} (18000) - Finished processing boot loader log
```

Figure 6 Example: Boot file with errors

```
2008-07-16T13:10:45.089 [INFO ] {BootLoader} (18000) - Start processing boot loader log
2008-07-16T13:10:45.188 [WARN ] {BootLoader} (18001) - Self test was unable to provide results. Flash memory
may be malfunctioning
2008-07-16T13:10:45.188 [INFO ] {BootLoader} (18000) - Finished processing boot loader log
```

Testing basic hardware functionality

This section describes how to test the components of the BCM450 system, and how to troubleshoot them if they fail the test.

Use the following procedures to help isolate and identify problems with your BCM450 hardware:

- [To test the main unit](#) on page 29
- [To troubleshoot the main unit](#) on page 29
- [To test the expansion unit](#) on page 29
- [To troubleshoot the expansion unit](#) on page 30
- [Testing an MBM](#) on page 30
- [Troubleshooting the FEM](#) on page 31
- [To determine why the ATA 2 does not function](#) on page 31
- [To determine why there is no dial tone at the ATA2](#) on page 32
- [To check the ATA2 wiring](#) on page 32
- [Reset to factory settings](#) on page 32
- [To perform a Level 1 reset \(configuration reset\)](#) on page 34

To test the main unit

If you have the digital station feature included in your installed keycode, use the following test to ensure the main unit is operating properly:

- 1 Go to an extension that is connected to the RJ-21 telephony connector on the main unit.
- 2 Check for a dial tone.
- 3 Use this extension to make a call to another extension on the system.
- 4 If this system has an expansion unit with a media bay module (MBM) that supports extensions, repeat steps 3 and 4 for an extension connected to the expansion unit.
- 5 Go to an extension that has access to one of the lines on the main unit.
- 6 Select the line or line pool to which the line belongs.
- 7 Check for a dial tone.
- 8 Make a call using the line or line pool.
- 9 If this system has an expansion unit with an MBM that supports lines, repeat steps 6 to 8 with an extension that can access one of the lines connected to the expansion unit.

To troubleshoot the main unit

If a test fails, use the following procedure:

- 1 Verify that any nonfunctional feature is included in your installed keycode.
- 2 Check the wiring to the main unit and to the MBMs. Make sure that the cables are properly seated and are connected to the correct ports.
- 3 Reboot the BCM450 system.
- 4 Check LEDs.
- 5 Use Element Manager or the Telset Administration feature to check the programming for the lines or extensions that failed the call test.
- 6 If the programming is incorrect, use the Backup and Restore Utility to load a recent backup of system programming. If a recent backup is not available, correct the programming using Element Manager or the Telephone Administration feature.

To test the expansion unit

Use the following test to ensure the expansion unit is operating properly:

- 1 Make sure that the BCM450 system is fully booted.
- 2 Check the power and status LEDs on the MBM that is inserted in the expansion unit. Both LEDs must be solid green. If either LED is not solid green, a problem exists with the MBM or the expansion unit.
- 3 If the expansion unit has an MBM that supports extensions, go to an extension that is connected to the MBM.

- 4 Check for a dial tone.
- 5 Use this extension to make a call to another extension on the system.
- 6 If the expansion unit has an MBM that supports lines, go to an extension that has access to one of the lines on the MBM.
- 7 Select the line or line pool to which the line belongs.
- 8 Check for a dial tone.
- 9 Make a call using the line or line pool.

To troubleshoot the expansion unit

- 1 Check that the correct feature for the expansion unit is included in your installed keycode.
- 2 Check that the expansion port is connected to the proper connector.
- 3 Check the wiring to the MBM. Make sure that the cables are properly seated and are connected to the correct ports with proper LED indications.
- 4 Check that the switches on the MBM are all set to on.
If the MBM is a GASM or GATM, all the switches on the right are not on.
To check the MBM switches, you must remove the MBM from the expansion unit.
- 5 Perform a firmware download to ensure that the correct version is loaded on the ASM/GASM or GATM unit.
- 6 Use Element Manager or Telset Admin to check the programming for the lines or extensions connected to the MBM.
- 7 Reboot the system to ensure that the BCM450 main unit functions correctly.
- 8 If the programming is incorrect, use the Backup and Restore Utility to load a recent backup of system programming. If a recent backup is not available, correct the programming using Element Manager or the Telephone Administration feature.

Testing an MBM

Use the following procedure to test an MBM installed in the main unit or expansion cabinet.

If you are experiencing an issue with an FEM, ensure all DIP switches are set to the On position.

Procedure steps

Step	Action
1	Check the Power and Status LEDs on the MBM. Both LEDs must be solid green. If either LED is not solid green, a problem exists with the MBM.
2	Go to an extension on the MBM if it is a station MBM.
	OR

Go to an extension that has access to one of the lines on the MBM if it is a trunk MBM. Select the line or line pool to which the line belongs.

- 3 Check for a dial tone.
- 4 Use this extension to make a call to another extension on the system if it is a station MBM.

OR

Make a call using the line or line pool if it is a trunk MBM.

- 5 Use this extension to make a call to an external telephone number if you are testing a station MBM.

--End--

Determining why an MBM does not appear in Element Manager

Use the following procedure if an installed MBM does not appear in Element Manager.

Procedure steps

- | Step | Action |
|------|--|
| 1 | Check that the correct feature is included in your installed keycode. |
| 2 | Check that both the Power and Status LEDs on the MBM are solid green. |
| 3 | If the Power LED is off, and the MBM is installed in the expansion cabinet, check that the power supply cable is properly seated in the expansion cabinet and the power supply is connected to a working power outlet. |
| 4 | Ensure that the MBM is properly seated in the MBM bay. |
| 5 | If the Status LED is not solid green, and the MBM is installed in the expansion cabinet, check that the Expansion cable is properly seated in the Expansion port on the expansion cabinet and on the main unit. |
| 6 | Ensure that the MBM is enabled using either Element Manager or Telset Administration. If the MBM is enabled, disable and re-enable it. |
| 7 | Ensure that all DIP switches are set correctly. |

--End--

Troubleshooting the FEM

Use the following procedure to troubleshoot an installed fibre expansion module (FEM).

- 1 Ensure that all six connector LEDs are lit.
- 2 If all six LEDs are not lit, ensure that all six DIP switches are set to the On (up) position.

--End--

To determine why the ATA 2 does not function

- 1 Check for a dial tone using an analog device.
- 2 Check that AC power is connected to the ATA 2 unit.

- 3 Check that the correct feature for digital sets is included in your installed keycode.
- 4 Verify that the ATA2 is connected to a digital station port.
- 5 Allow sufficient startup time (30–60 sec).
- 6 Plug an analog device into the phone port of the ATA2 and check for a dial-tone.
- 7 In Element Manager, verify that the ATA 2 is correctly configured:
 - a Select **Configuration > Telephony > Sets > All DNs**.
 - b Select the appropriate DN from the list and click the ATA settings tab.
The options for the Device Type are Modem or Telephone.

To determine why there is no dial tone at the ATA2

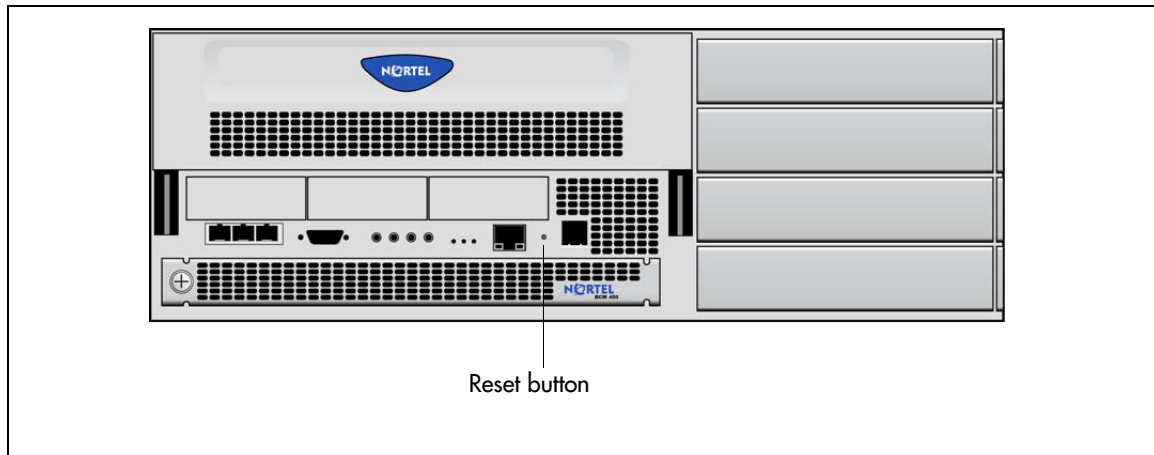
- 1 If you hear no dial tone, replace a single-line telephone for the data communication device.
- 2 If you hear no dial tone at the ATA2 unit:
 - a Disconnect the line side of the ATA2. Connect a digital telephone to the ATA2 port.
 - b Check that the connection from the ATA2 to the BCM450 hardware works correctly.

To check the ATA2 wiring

- 1 Use an analog phone to test the ATA2.
- 2 Check the following connections:
 - a ATA 2 to the terminal
The resistance must be 200 ohms or less for data applications and 1300 ohms or less for voice applications.
 - b BCM450 hardware to the ATA2
The wiring must be equivalent to 800 m of 0.5 mm wire (2600 ft. of 24-AWG) or less. Do not use bridge taps and loading coils between the BCM450 hardware and ATA2.

Reset to factory settings

This section describes how to reset the BCM450 system to the factory settings or a stable working condition using the reset switch (see the figure [Reset switch location](#) on page 33). When the BCM450 is in this condition, you can make further modifications.

Figure 7 Reset switch location

Some possible situations in which you use the reset feature are:

- If the BCM450 system is configured incorrectly to an extent that it is no longer functional. The customer must use a level 1 reset to return to the default system programming and restore a previous configuration or reconfigure the system.
- If distributors want to reuse BCM450 systems, they must first erase all customer-specific data using a level 1 or level 2 reset.

Reset levels

Reset to factory settings is a stand-alone feature that has the following levels of reset:

- **Level 1** reset erases all customer-specific data and restores the default configuration for all components. This reset leaves the software components untouched. That is, the system has the latest release and patch level of the software installed. Only the system and user configuration data is erased and replaced with default values.
- **Level 2** reset erases all customer and system configuration data and all software releases and patches. This reset re-installs the original factory configuration settings.



Warning: If you perform a Level 2 reset to solve an undetermined problem and still have access to Element Manager, you must retrieve all the log files for technical support before performing the Level 2 reset. A Level 2 reset erases all log files from the system.

Activate the reset feature

You activate the reset feature through the Maintenance CLI or the Configuration CLI. When you initiate a reset from the CLI menu, no further action is needed to complete the reset. You can monitor the progress of the reset by observing the LED states, or through the serial connection. It is important that you wait for the system to complete the reset before taking any further action; do not interrupt the reset process.



Warning: Before performing a Level 1 or Level 2 reset, review all the effects of the levels of reset. See [Reset levels](#) on page 33.

To perform a Level 1 reset (configuration reset)

- 1 Access the CLI. For information about how to access the CLI, refer to [Command Line Interface](#) on page 80.
- 2 From the Configuration CLI, select option 4—Configuration Reset. If you are using the Maintenance CLI, select option 5—Configuration Reset.
- 3 The LEDs will progress through the start-up and shut down sequence. This process may take more than 2 minutes.
- 4 A Status LED that is flashing yellow, and a Power LED that is solid red, indicates that a configuration reset is in progress. This process may take more than 2 minutes.
- 5 The system reboots to the Main OS. This process may take more than 2 minutes.

To perform a Level 2 reset (software reset)

- 1 Access the CLI. For information about how to access the CLI, refer to [Command Line Interface](#) on page 80.
- 2 From the Configuration CLI, select option 5—Software Reset. If you are using the Maintenance CLI, select option 6—Software Reset.
- 3 The LEDs will progress through the start-up and shut down sequence. This process may take more than 2 minutes.
- 4 A Status LED that is flashing yellow, and a Power LED that is solid red, indicates that a software reset is in progress. This process may take more than 5 minutes.
- 5 The system reboots to the Main OS. This process may take more than 2 minutes.

Monitoring the boot process

- 1 Connect a serial cable with a 9-pin female connector from the serial port on a PC to the serial port on the BCM450.
- 2 Ensure that you use the following settings:
 - bits per second: 115200

- data bits: 8
 - parity: N
 - stop bits: 1
 - no flow control
- 3** Use a terminal emulation program, such as Hyperterminal or Nortel CLI Manager, to establish a connection to the BCM450.
 - 4** Reboot the system and observe the boot process. Figure 8 shows an example of a boot process when there is failed or missing memory; Figure 9 shows an example of a boot process when there is a failed or missing hard drive.
 - 5** If the system starts normally, the CLI login prompt displays when the boot cycle is complete.

Figure 8 Boot process with failed or missing memory

```
BCM U-Boot 1.2.0 (Jul 8 2008 - 18:51:26)
CPU: 8568_E, Version: 1.1, (0x807d0011)
Core: E500, Version: 2.2, (0x80210022)
Clock Configuration:
  CPU:1333 MHz, CCB: 533 MHz,
  DDR: 266 MHz, LBC: 33 MHz
  QE: 533 MHz
L1:  D-cache 32 kB enabled
     I-cache 32 kB enabled
Board: BMB450 R1.0
I2C:  ready
DRAM: Initializing
Unable to locate DDR I or DDR II module.
      Fundamental memory type is 0x0
      DDR: *** failed ***
### ERROR ### Please RESET the board ###
```

Figure 9 Boot process with failed or missing hard drive

```
BCM U-Boot 1.2.0 (Jul 8 2008 - 18:51:26)
CPU: 8568_E, Version: 1.1, (0x807d0011)
Core: E500, Version: 2.2, (0x80210022)
Clock Configuration:
  CPU:1333 MHz, CCB: 533 MHz,
  DDR: 266 MHz, LBC: 33 MHz
  QE: 533 MHz
L1:  D-cache 32 kB enabled
     I-cache 32 kB enabled
Board: BMB450 R1.0
I2C:  ready
DRAM: Initializing
      DDR: 512 MB
POST: running... POST memory PASSED
L2 cache 512KB: enabled
FLASH: 8 MB
Reboot Reason: Power Recycle
Configuring Mac address from NsSecSi PROM
PCI: first=0 last=0
PCIe: LTSM=0x16
PCIe: first=1 last=1
In:  serial
Out: serial
Err: serial
Net: FSL UEC1, FSL UEC0, FSL UEC2, FSL UEC3, FSL UEC4, FSL UEC5, FSL UEC6, FSL UEC7
IDE: Bus 0: not available
Fatal Error Occurred
```

Chapter 4

Software Troubleshooting

Use the information in this chapter to troubleshoot problems related to the BCM450 software components.

Navigation

Complete the following tasks, in the order shown below, to troubleshoot some of the common problems that you may encounter with the BCM450 software:

- [Verify the software version](#) on page 37
- [Verify the keycodes](#) on page 37
- [Check the programming of lines and phones](#) on page 37
- [Restoring system data](#) on page 46
- [Verify the software inventory](#) on page 48

Verify the software version

In the Element Manager, select **Help > About**. A panel displays and provides information about the Element Manager, such as the Release level.

Verify the keycodes

If a specific feature is not functioning, verify that the feature is included in your installed keycodes. For information about how to verify the installed keycodes, see [Verify the keycodes](#) on page 24.

Check the programming of lines and phones

You can use the Element Manager to view the programming of lines and phones. When you view the lines, the information on the panels may vary, depending on the type of line.

The Element Manager displays line information in two sections:

- The main section, [Trunk/Line data](#), is located at the top of the screen and provides a table of lines and the current or default settings.
- The bottom section contains three tabs. The contents of the tabs may vary, depending on the line selected in the top table.
 - The [Properties](#) tabbed panel provides the settings for individual line characteristics.
 - The [Preferences](#) tab shows information that may vary from trunk to trunk

- The [Restrictions](#) tabbed panel allows you to define which restrictions will be active for individual lines. Note that lines that are assigned to the same line pool will automatically assign the same restrictions.
- The [Assigned DNs](#) tabbed panel provides a quick way to assign lines to telephones. You must use the DN records panels to assign line pools to telephones.

Check line programming

Use the following procedure to check line programming in your BCM450 system.

To check line programming

- 1 In the **Task Navigation Panel**, select the **Configuration** tab.
- 2 Select **Telephony > Lines**.
- 3 Verify that the programming for all lines is correct; see [Trunk/Line data](#) on page 38 for an explanation of the fields on the panel.
- 4 Select a line, and then select a tab:
 - a Select the **Properties** tab and verify that the settings are correct; see [Properties](#) on page 40 for an explanation of the fields on the tab.
 - b Select the **Preferences** tab and verify that the settings are correct; see [Preferences](#) on page 42 for an explanation of the fields on the tab.
 - c Select the **Restrictions** tab and verify that the settings are correct; see [Restrictions](#) on page 45 for an explanation of the fields on the tab.
 - d Select the **Assigned DNs** tab and verify that the settings are correct; see [Assigned DNs](#) on page 46 for an explanation of the fields on the tab.
- 5 Repeat step 4 for the remaining lines.
- 6 Correct any programming problems, or restore the system data; see [“Restoring system data” on page 46](#) for more information.

Trunk/Line data

The top-level Table View panel shows line records for all lines active on the system, and the common assigned parameters.

[Table 7 on page 38](#) describes the fields found on the Trunk/Line Data main panel.

Table 7 Trunk/Line Data main panel (Sheet 1 of 3)

Attribute	Value	Description
Line	This list contains all the possible line numbers for the system, including target lines.	Configure only those lines that are active on the system. (Click the Active check box and ensure that the Inactive check box is empty).

Table 7 Trunk/Line Data main panel (Sheet 2 of 3)


Attribute	Value	Description
Trunk Type	PSTN-based lines, VoIP, Target	There are three main categories of lines: PSTN-based lines: (analog, T1, PRI, BRI) Voice over IP (VoIP) trunks, which connect through the LAN or WAN. Target lines, which are internal channels that provide direct dial capability.
Name	<maximum of seven alphanumeric characters>	Identify the line in a way that is meaningful to your system, such as by the type of line and line pool or the DN it is attached to in the case of target lines.
Control Set	DN <control telephone DN> Default: 221 (default Start DN)	Enter a telephone DN for a telephone that you want to use to turn service off or on for other telephones using this line. The control telephone must have the line assigned, or must be assigned to the line pool the line is in.
	Tips: External lines and telephones must be programmed to use one of the Scheduled Services: Ringing, Restriction, and Routing Services. For maximum flexibility, Nortel recommends that you create two different control telephones, one for the lines and one for the telephones. You can turn on a service manually or automatically for all external lines from an assigned control telephone. However, you cannot combine schedules. A service can only be active as normal service or one of the six schedules at any one time. Several schedules can be active at one time, but they must use different services.	
Line Type	Public Private to: <telephone DN> Pool A to O, BlocA to BlocF	Define how the line is used in relation to other lines in the system. <ul style="list-style-type: none"> Public line: can be accessed by more than one telephone. Private line: can be assigned only to one telephone and the prime telephone for that line. Enter the internal number of the telephone. Pool A - O (analog and T1 lines) BlocA to BlocF (PRI and VoIP lines): assigns the line to one of the line pools. If a line is assigned to a line pool, but is not assigned to any telephone, that line is available only for outgoing calls. Bloc line pools must be used in conjunction with routes and destination codes. Target lines cannot be put into line pools.
Prime set	DN: <telephone DN> None	Assign a telephone to provide backup answering for calls on the line. For an Auto Answer line, calls are redirected if the received number is invalid or the target line is busy, and if the If busy parameter is set To prime . Each line can be assigned only one prime telephone.

Table 7 Trunk/Line Data main panel (Sheet 3 of 3)

Attribute	Value	Description
Pub. Received # (Target lines only)	<digits associated with a specific target line>	Specify the digits the system will use to identify a call from the public network to this target line. <ul style="list-style-type: none"> A received number cannot be the same as, or be the start digits, of a line pool access code, a destination code, the DISA DN or the Auto DN. If you are configuring auto-answer BRI trunks to map to target lines, the received number should be the same as the Network DN supplied by your service provider. The call will be directed to the prime telephone for the incoming line if the Network DN is not used.
Priv. Received # (Target lines only)	<digits associated with a specific target line>	Specify the digits the system will use to identify a call from the private network to this target line. <ul style="list-style-type: none"> A received number cannot be the same as, or be the start digits, of a line pool access code, a destination code, the DISA DN or the Auto DN. If you are configuring auto-answer BRI trunks to map to target lines, the received number should be the same as the Network DN supplied by your service provider. The call will be directed to the prime telephone for the incoming line if the Network DN is not used.
Distinct ring	None Pattern 2 Pattern 3 Pattern 4	Choose the distinctive ring pattern that you want to assign to the line. This allows you to provide selective service to calls with differing answer priorities. When more than one line with the distinct ring settings rings at a telephone, the line with the highest priority rings first. <ul style="list-style-type: none"> Pattern 4 has the highest ring priority Pattern 3 has second highest ring priority Pattern 2 has third highest ring priority None has the lowest ring priority. By default, all telephones and lines are set to None.

Properties

The Properties tab shows basic line properties. Not all fields apply to all types of lines.

The Properties tab is shown in [Figure 10 on page 41](#).

Figure 10 Properties details panel

Details for Line: 063

Properties Preferences Restrictions Assigned DN's

Trunk mode: Supervised

Dial mode: Tone

Loss package: Medium CO

Impedance (Ohms): 600

Link at CO: ☐

Line Tuning Digit: 1

Table 8 on page 41 defines the fields on this panel and indicates the lines.

Table 8 Properties line settings (Sheet 1 of 2)

Attribute	Value		Description					
Legend: Loop = analog/digital loop; GS = ground start; DID = DID; E&M = E&M; BRI = BRI; DPNSS = DPNSS; VoIP = VoIP; TL = Target. Note: PRI fields are all included under the main table.								
Trunk mode	Loop							
	Unspr Supervised *Earth calling *Loop guarded *Loop unguarded **ROE, ROI		Define whether disconnect supervision, also referred to as loop supervision, releases an external line when an open switch interval (OSI) is detected during a call on that line. You must set this to Supervised if a loop trunk has its Answer mode set to Auto or if you enable Answer with DISA. Disconnect supervision is also required to conference two external callers. The line must be equipped with disconnect supervision from the central office for the Supervised option to work. * These listing only appear for UK analog lines. ** These appear only for Australia.					
Dial mode	Loop	GS	DID	E&M				
	Pulse Tone		Specify whether the system uses dual tone multifrequency (DTMF) or pulse signaling on the trunk. Tone does not appear if Signaling is set to Immediate (T1 DID &T1 E&M trunk types only).					
Loss package	Loop (analog only)							
	Short CO Medium CO Long CO Short PBX Long PBX		Select the appropriate loss/gain and impedance settings for each line.					
Impedance (Ohms)	Loop (analog only)							
	600 ohm-900 ohm		The GATM can be set to a specific impedance level.					

Table 8 Properties line settings (Sheet 2 of 2)

Attribute	Value	Description
Legend: Loop = analog/digital loop; GS = ground start; DID = DID; E&M = E&M; BRI = BRI; DPNSS = DPNSS; VoIP = VoIP; TL = Target. Note: PRI fields are all included under the main table.		
Signaling	DID	E&M
	WinkStart Immediate DelayDial	Select the signal type for the line. The immediate setting does not appear for T1 E&M or T1 DID trunks connected to a DTM if the Dial mode is set to tone. Make sure that this matches the signal type programmed for the trunk at the other switch.
Link at CO	Loop (analog only)	
	<check box>	Some exchanges respond to a Link signal, also called hook flash (FEATURE 71), by providing an alternative line for making outgoing calls. Enabling Link at CO causes the system to apply the restrictions on outgoing calls to the digits dialed after the Link signal. As well, the call on the alternative line is subject to all restrictions. Disabling Link at CO prevents a Link signal from resetting the BCM450 restrictions in cases where the host exchange does not provide an alternative line.
Line Tuning Digit	drop-down menu	Select the line tuning digit to use. When a trunk is connected, the BCM450 starts a call and sends this digit to the CO to turn off the dial tone signal, and then tests the line to optimize the trunk levels. The default digit is 1. You may need to change the default digit if your CO uses the digit 1 to route the call to a special service or to a second dial tone or busy/re-order tone. Select the digit that will result in silence on the trunk.

Preferences

The Preferences tab shows information that may vary from trunk to trunk. Most of this information needs to coordinate with the line service provider equipment.

The Preferences tab is shown in Figure 11.

Figure 11 Preferences details panel

Details for Line: 061

Properties Preferences Restrictions Assigned DNs

Auto privacy ☒

Full autohold ☐

Aux. ringer ☐

Distinct rings in use

Answer mode

Voice message center

Redirect to

Table 9 defines the fields on this panel and indicates the lines.

Table 9 Preferences details fields for lines (Sheet 1 of 3)

Attribute	Value		Description					
Legend: Loop = analog/digital loop; GS = ground start; DID = DID; E&M = E&M; BRI = BRI; DPNSS = DPNSS; VoIP = VoIP; TL = Target and DASS2. Note: PRI fields are all included under the main panel.								
Auto privacy	Loop	GS	DID	E&M	BRI		VoIP	
	<check box>		Define whether one BCM450 user can select a line in use at another telephone to join an existing call.					
Full autohold	Loop				BRI	DPNSS	VoIP	
	<check box>		<p>Enables or disables Full autohold.</p> <p>When enabled, if a caller selects an idle line but does not dial any digits, that line is automatically placed on hold if you then select another line.</p> <p>Full autohold is always in place for T1 E&M trunks because it has no meaning for incoming-only T1 DID trunks.</p> <p>The default setting should be changed only if Full autohold is required for a specific application.</p>					
Aux. ringer	Loop	GS	DID	E&M	BRI	DPNSS	VoIP	TL
	<check box>		<p>Turn the auxiliary ringer on or off for all telephones using this line.</p> <p>When programmed on a line, the auxiliary ringer will ring every time a call is received.</p>					
	<p>Note: When programmed only on a telephone, no ring occurs for a transferred call.</p> <p>An auxiliary ringer can also be programmed in Services to ring for a line placed into a scheduled Ringing service.</p>							
ANI Number		DID	E&M					
	<check box>		<p>Define whether the telephone number of the caller will be shown for this line.</p> <p>For T1 E&M and T1 DID trunks connected to a DTM, this setting only appears if Signaling is set to WinkStart.</p> <p>The central office must deliver ANI/DNIS in DTMF mode. No additional equipment is required.</p>					
DNIS Number			E&M					
	<check box>		<p>Defines whether the digits dialed by an external caller on this line will be shown. For T1 E&M trunks connected to a DTM, this setting only appears if Signaling is set to WinkStart and Answer mode is set to Manual.</p>					
Distinct Rings in use	<read-only>		Indicates if a special ring has been assigned. See Distinct Ring on the main table.					

Table 9 Preferences details fields for lines (Sheet 2 of 3)

Attribute	Value		Description					
Legend: Loop = analog/digital loop; GS = ground start; DID = DID; E&M = E&M; BRI = BRI; DPNSS = DPNSS; VoIP = VoIP; TL = Target and DASS2. Note: PRI fields are all included under the main panel.								
Answer mode	Loop	GS		E&M	BRI	DPNSS		
	Manual Auto		Define whether a trunk is manual or automatic answer. Auto answer mode allows the trunk to be a shared resource by the system telephones. This shared resource is created through routing to target lines or using DISA. For auto answer trunks being used to allow remote call-in from system users, the trunk can be configured to answer with a straight dial tone, if DISA has not been enabled. It can also be configured to answer with a stuttered dial tone if DISA is enabled and the caller is expected to enter a CoS password. The CoS password defines which system features the caller is permitted to access. Manual answer trunks are assigned to one or more telephones. The assigned telephones exclusively own the line.					
	Note: You require Disconnect supervision on the line if loop start trunks are to operate in auto-answer mode.							
Answer with DISA	Loop	GS		E&M	BRI			
	<check box>		Define whether the system prompts a caller for a six-digit class of service (CoS) password. This setting appears for T1 loop start, T1 E&M lines that have auto-answer mode, and analog trunks. Set this option to No for T1 E&M lines on a private network that have auto-answer mode.					
If busy								TL
	To Prime Busy Tone		Define whether a caller receives a busy tone or the call forwards to the prime telephone when the target line is busy. Busy tone only works for PRI trunks.					
	Tips: The duration of an open switch interval (OSI) before BCM450 disconnects a call is programmed by the Disconnect timer setting.							
Voice Message Center	Loop	GS	DID	E&M	BRI	DPNSS	VoIP	TL
	Center 1 - Center 5		If this line connects to a remote voice mail, either through the private network or at the Central Office, indicate which Center number has been configured with the contact number. The system calls that number to check voice mail messages when a message indicator is presented to a telephone.					
Redirect to	Loop	GS	DID	E&M				TL
	<dial string>		Enter a dial string (including destination code) to redirect the line to an external telephone, such as a call attendant on another system. If you want to stop redirection, you need to delete the dial string and allow the record to update. Warning: If the dialstring is set up, the line will immediately be redirected out of the system not ringing any telephone.					

Table 9 Preferences details fields for lines (Sheet 3 of 3)

Attribute	Value	Description
Legend: Loop = analog/digital loop; GS = ground start; DID = DID; E&M = E&M; BRI = BRI; DPNSS = DPNSS; VoIP = VoIP; TL = Target and DASS2. Note: PRI fields are all included under the main panel.		
Warning: Enable modules If you disabled any trunk media bay modules prior to performing programming, enable them now to ensure your system will function properly.		

Restrictions

Assigning Line restrictions and Remote Access Package restrictions are part of the configuration for controlling calls out of the system (line restrictions) and into the system from a private network node or from a remote user calling in over the PSTN lines (Remote Access Packages).

The Restrictions tab shows the restrictions for a line.

Details for Line: 061

Properties Preferences **Restrictions** Assigned DN's

Use remote package 00

Line Restrictions		Remote Restrictions	
Schedule	Use Filter	Schedule	Use Filter
Normal	03	Normal	04
Night	21	Night	31
Evening	22	Evening	32
Lunch	23	Lunch	33
Sched 4	00	Sched 4	00
Sched 5	00	Sched 5	00
Sched 6	00	Sched 6	00

Table 10 describes the fields on this panel.

Table 10 Restrictions

Attribute	Values	Description
Use remote package	<remote package #>	If the line is being used to receive external calls or calls from other nodes on the private network, ensure that you indicate a remote package that provides only the availability that you want external callers to have. This attribute is typically used for tandeming calls.
Schedule	Default: Normal, Night, Evening, Lunch, Sched 4, Sched 5, Sched 6	
Line Restrictions - Use Filter	<00-99>	Enter the restriction filter number that applies to each schedule. (controls outgoing calls)
Remote Restrictions - Use Filter	<00-99>	Enter the restriction filter that applies to each schedule. This setting provides call controls for incoming calls over a private network or from remote user dialing in over PSTN)

Assigned DNs

The Assigned DNs tabbed panel displays the DN properties for lines that are assigned to telephones.

This information can also be configured on the DN record. Any information added, deleted or modified in this table reflects in the DN record.



Note: Lines that do not allow single-line assignment, such as PRI lines and VoIP lines, will not display this tabbed panel.

Restoring system data

If the programming of lines and extensions is incorrect, you can restore from an archive file, or you can restore the system to factory defaults. This section provides the procedures to follow to restore system data from an archive file, and to restore factory defaults. For information about the effects of performing a restore operation, or about optional components, see the *BCM450 Administration and Security Guide* (NN40160-601)

Restoring data from an archive



Caution: A backup operation can interrupt services running on the BCM450. A warning displays whenever the backup will cause a service interruption. If you want to perform a backup that does not affect the system, you can exclude services that would be affected. Alternatively, you can include these services and perform a backup at a time when the system is typically not in use.

To restore data from an archive

- 1 In the task panel, click the **Administration** tab.
- 2 Open the **Backup and Restore** folder, and then click **Restore**.
The **Restore** panel opens. The **Restore From** selection field has **BCM** as a default value.
- 3 In the **Restore From** selection field, select the location of the archive file to restore:
 - BCM
 - My Computer
 - Network folder
 - FTP server
 - SFTP server
 - USB storage device
 - Factory Default
- 4 Click the **Restore** button.
The **Select Components to Restore** window opens.

- 5 Select the optional components that you want to include from the backup file.
- 6 Click the **OK** button.
A warning window opens and displays information about components that will be affected by the restore operation. Read the warning carefully before proceeding.
- 7 Click the **Yes** button to proceed.
A progress window opens. When the operation is complete, the **Restore Complete** window opens.
- 8 Click the **OK** button.

Restoring the factory configuration



Caution: A restore operation is a service-affecting operation. A number of services running on the BCM450 system will be stopped and then restarted using the restored configuration or application data. A reboot is required if you choose Keycodes as a restore option. It will take several minutes before Voicemail is working again.

To restore the factory configuration

Your BCM450 is delivered with a backup file that was created at the factory. This file can be a helpful starting point if you decide to completely re-configure your BCM450 and would like to erase the settings programmed on your device. Although you can select individual components to restore, Nortel recommends that you restore all components when using this option.

- 1 In the task panel, click the **Administration** tab.
- 2 Open the **Backup and Restore** folder, and then click **Restore**.
The **Restore** panel opens.
- 3 In the **Restore From** selection field, select **Factory Default**.
A warning dialog box displays.
- 4 Click the **Restore** button.
The **Select Components to Restore** panel opens.
- 5 Select the optional components that you want to include from the backup archive.
- 6 Click the **OK** button.
A warning window opens and displays information about components that will be affected by the restore operation. Read the warning carefully before proceeding.
- 7 Click the **Yes** button to proceed.
A progress window opens. When the operation is complete, the **Restore Complete** window opens.
- 8 Click the **OK** button.

Verify the software inventory

This section provides information about how to verify the level of software components and obtain updates to your software inventory. For information about applying software updates, please refer to the *BCM450 Administration and Security Guide* (NN40160-601).

Viewing the inventory of BCM450 software

BCM450 software is organized into software components that you can individually update as required. The version of each software component is tracked so that you can determine the exact software release level of a BCM450 to the component level.

You can view the complete inventory of software installed on the BCM450. The Software Inventory table displays all the software components installed on the system, the functional group and the software version of each component.

Table 11 lists the information displayed in the Software Component Version Information table.

Table 11 Information displayed in the Software Component Version Information table

Column	Description
Component	The name of the software component installed on the BCM450. For example, backup-recovery.
Group	The functional group to which the software component belongs. For example, Operating System.
Version	The version of the software component.

You can change the order of the information displayed in the table by clicking a column heading and dragging it to a new place in the table. You can also sort the information in a column by descending or ascending order, by clicking the column heading.

To view the BCM450 software inventory

- 1 In the task panel, click the **Administration** tab.
- 2 Open the **Software Management** folder, and then click the **Software Inventory** task. The **Software Inventory** panel opens.
- 3 View the details in the **Software Component Version Information** table.

Obtaining software updates

Before you can apply a software update to your BCM450, you must obtain the software update and unzip the file. Authorized Nortel partners can download BCM450 software updates from the Nortel Technical Support web page.

To obtain updates from the Nortel Technical Support Web page

- 1** In your web browser, enter **www.nortel.com/cs** and then click the **Go** button.
The Nortel Technical Support Web page opens.
- 2** Download the required updates.
- 3** Create a directory for each update and unzip the downloaded file into a directory.

Chapter 5

Advanced Troubleshooting

This chapter contains examples of advanced troubleshooting procedures. You must be a system administrator to perform these procedures.

Navigation

- [Example 1: Cannot dial out from an analog trunk](#) on page 51
- [Example 2: Cannot dial out from a SIP or H323 VoIP trunk](#) on page 53
- [Example 3: IP set is not registering with the BCM450](#) on page 58
- [Example 4: Cannot install keycode or invalid keycode application](#) on page 60
- [Example 5: Cannot dial out from digital trunk](#) on page 61
- [Example 6: MeetMe Conferencing commands do not work, or conferencing is busy](#) on page 66
- [Example 7: Unable to apply a software update from a USB storage device](#) on page 67
- [Example 8: Element Manager incorrectly shows expansion cabinet as empty](#) on page 68

Example 1: Cannot dial out from an analog trunk

When you cannot dial out from an analog trunk, you may experience the following problems in your network:

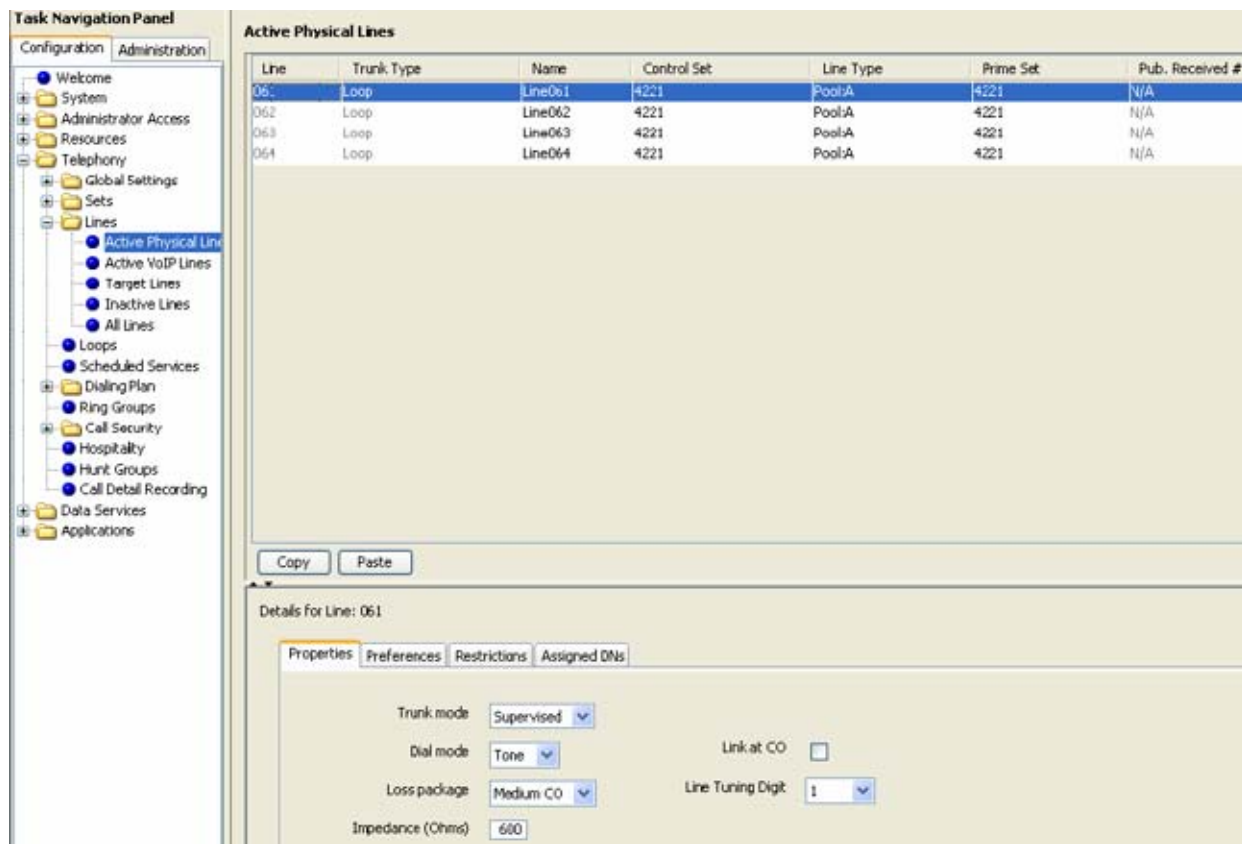
- you are unable to reach a destination number when you dial it
- there is no dial tone
- instead of a dial tone, you hear a re-order or fast-busy tone
- you hear a “wrong number” message from the central office.

Use the following procedure when you cannot dial out from an analog trunk.

Troubleshooting example 1

- 1 Check that the LED indicators on the BCM450 Chassis and the MBM are solid green.
- 2 Using an analog test set, verify that a dial tone is present at the MBM termination point.
- 3 From the Element Manager, select **Configuration > System > Keycodes** to view the list of installed features.
- 4 Verify that the appropriate keycode is active. For analog trunk modules, the keycode is **Exp Port**.
- 5 Select **Configuration > Resources > Telephony Resources** and select the appropriate trunk. Verify that the trunk is active.

- 6** Select **Configuration > Telephony > Lines > Active Physical Lines**. Select the appropriate line and verify that it is provisioned correctly. The Line Type should be Pool A, the Trunk Mode should be Supervised, and the Dial Mode should be Tone.



Task Navigation Panel

- Configuration
 - System
 - Administrator Access
 - Resources
 - Telephony
 - Global Settings
 - Sets
 - Lines
 - Active Physical Lines**
 - Active VoIP Lines
 - Target Lines
 - Inactive Lines
 - All Lines
 - Loops
 - Scheduled Services
 - Dialing Plan
 - Ring Groups
 - Call Security
 - Hospitality
 - Hunt Groups
 - Call Detail Recording
- Data Services
- Applications

- Administration

Active Physical Lines

Line	Trunk Type	Name	Control Set	Line Type	Prime Set	Pub. Received #
061	Loop	Line061	4221	PoolA	4221	N/A
062	Loop	Line062	4221	PoolA	4221	N/A
063	Loop	Line063	4221	PoolA	4221	N/A
064	Loop	Line064	4221	PoolA	4221	N/A

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Details for Line: 061

Properties Preferences Restrictions Assigned DN's

Trunk mode: Supervised

Dial mode: Tone

Loss package: Medium CO

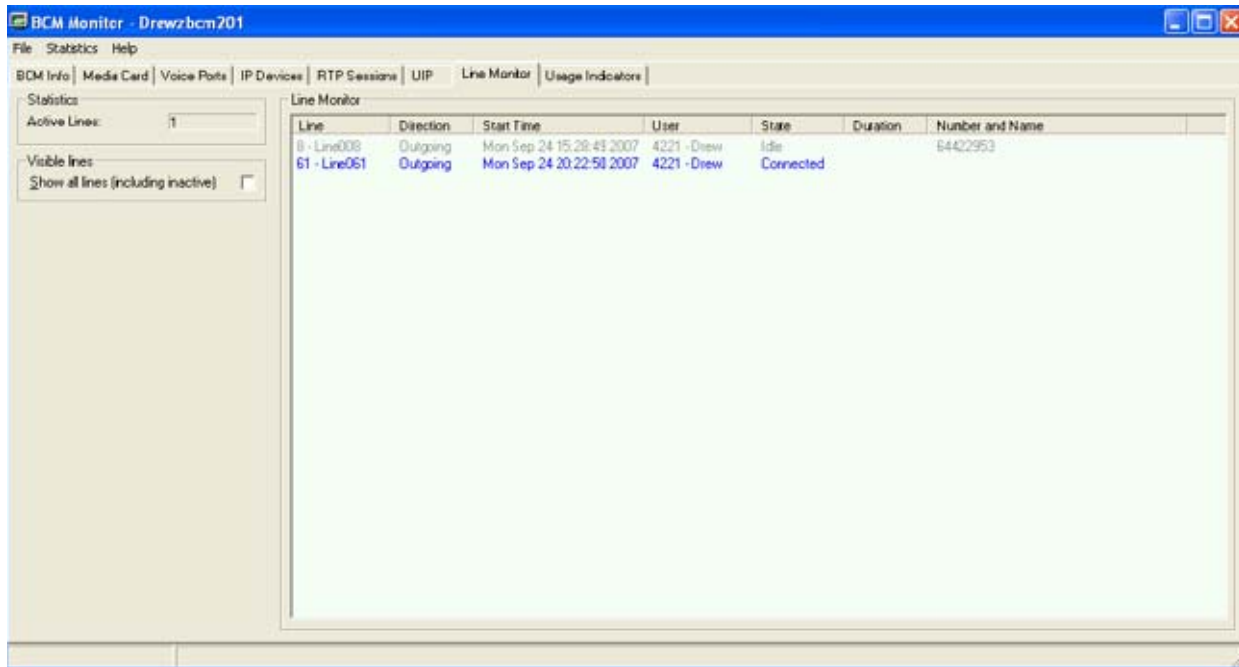
Impedance (Ohms): 600

Link at CO: ☐

Line Tuning Digit: 1

- 7** Select **Configuration > Telephony > Sets > Active Sets**. Select the appropriate set and verify that it is provisioned correctly. On the **Line Assignment** tab, verify that the **Appearance Type** is one of the following: appear only, appear and ring, or ring only.
- 8** Select **Administration > Utilities > BCM Monitor** and click the **Launch BCM Monitor** button.

9 Select the **BCM Info** tab and verify the status of the line.



Example 2: Cannot dial out from a SIP or H323 VoIP trunk

When you cannot dial out from a SIP or H323 VoIP trunk, you may experience the following problems in your network:

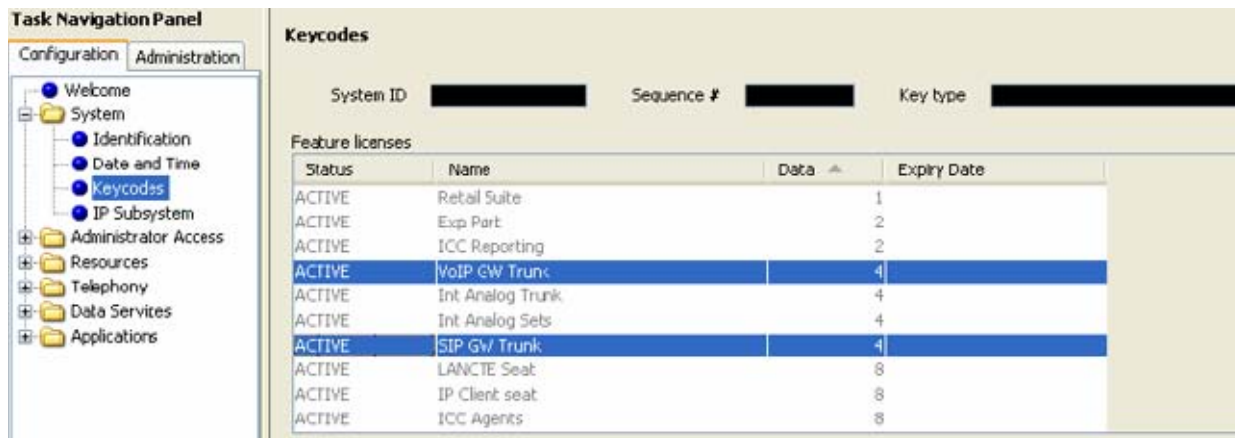
- you are unable to reach a destination number when you dial it
- there is no route to the destination

Use the following procedure when you cannot dial out from a SIP or H323 trunk.

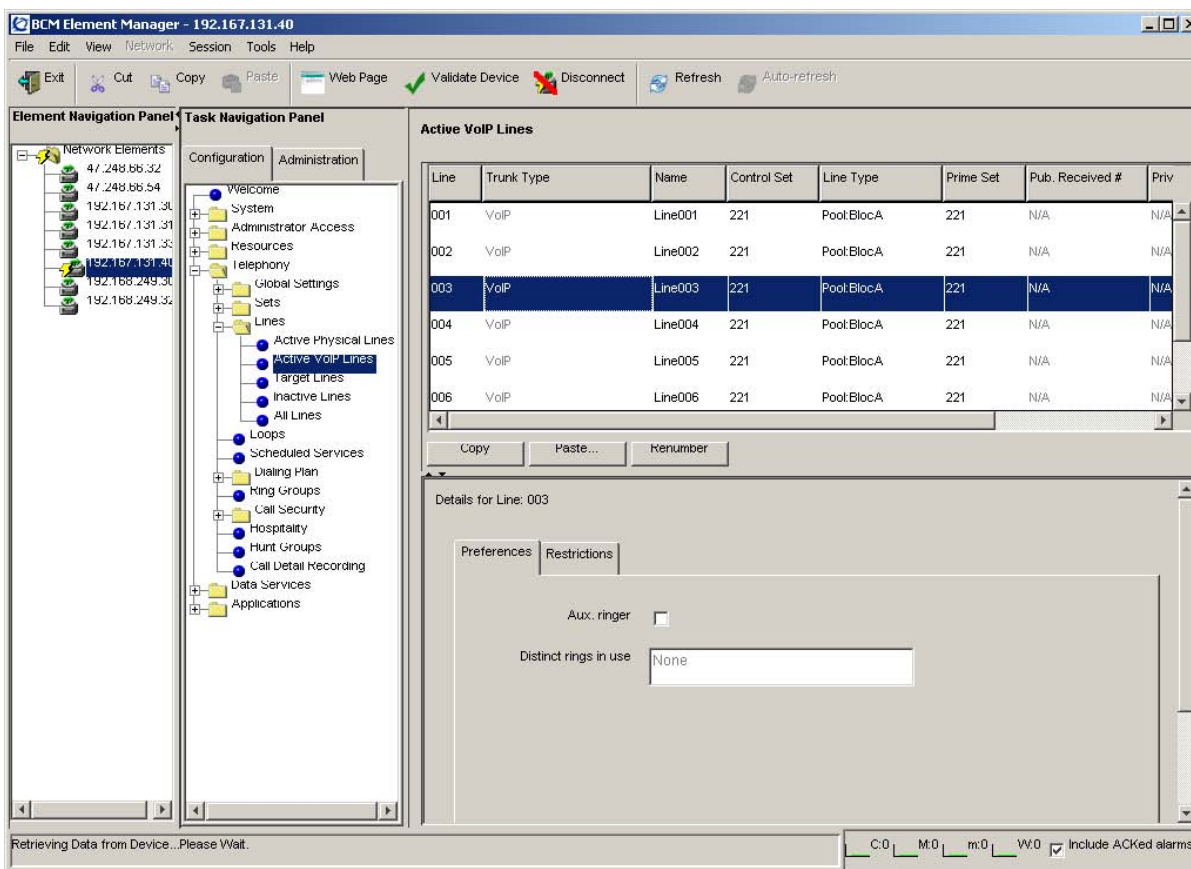
Troubleshooting example 2

- 1 Check that the LED indicators on the BCM Chassis are solid green.
- 2 From the Element Manager, select **Configuration > System > Keycodes** to view the list of installed features.

- 3 Verify that the appropriate keycode is active. For H323 trunks, the keycode is **VoIP GW Trunk**, and for SIP trunks, the keycode is **SIP GW Trunk**.

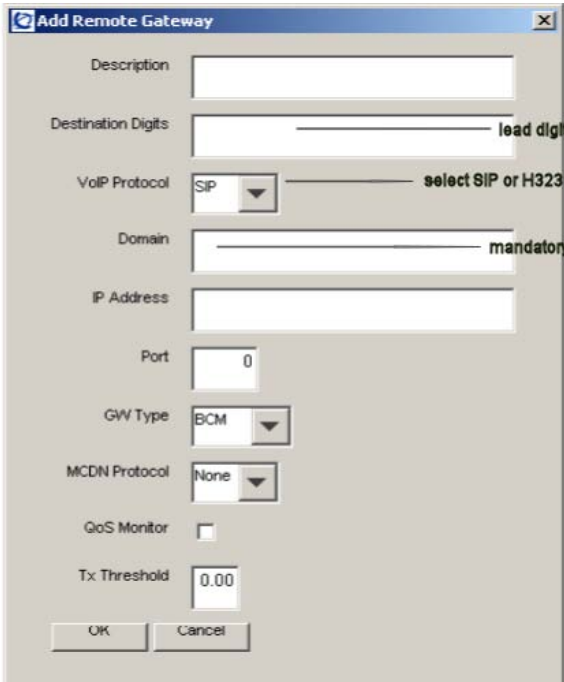


- 4 Select **Configuration > Telephony > Lines > Active VoIP Lines**. Select the appropriate line and verify that the Control Set and Prime Set are provisioned correctly.



- 5 Select **Configuration > Resources > Telephony Resources** and select the appropriate trunk.

- 6 Click the **Add** button to open the **Add Remote Gateway** dialog box. Verify that the remote gateway is configured correctly.



The **Add Remote Gateway** dialog box contains the following fields and options:

- Description:** Text input field.
- Destination Digits:** Text input field with a note: "lead digit to dial endpoint".
- VoIP Protocol:** Dropdown menu with "SIP" selected. A note points to it: "select SIP or H323 signalling to endpoint".
- Domain:** Text input field with a note: "mandatory field for SIP gateway".
- IP Address:** Text input field.
- Port:** Text input field with the value "0".
- GW Type:** Dropdown menu with "BCM" selected.
- MCDN Protocol:** Dropdown menu with "None" selected.
- GoS Monitor:** Check box, currently unchecked.
- Tx Threshold:** Text input field with the value "0.00".
- Buttons:** "OK" and "Cancel".

- 7 Select **Configuration > Telephony > Dialing Plan > Routing** and select the **Routes** tab. Verify that the route is configured correctly.

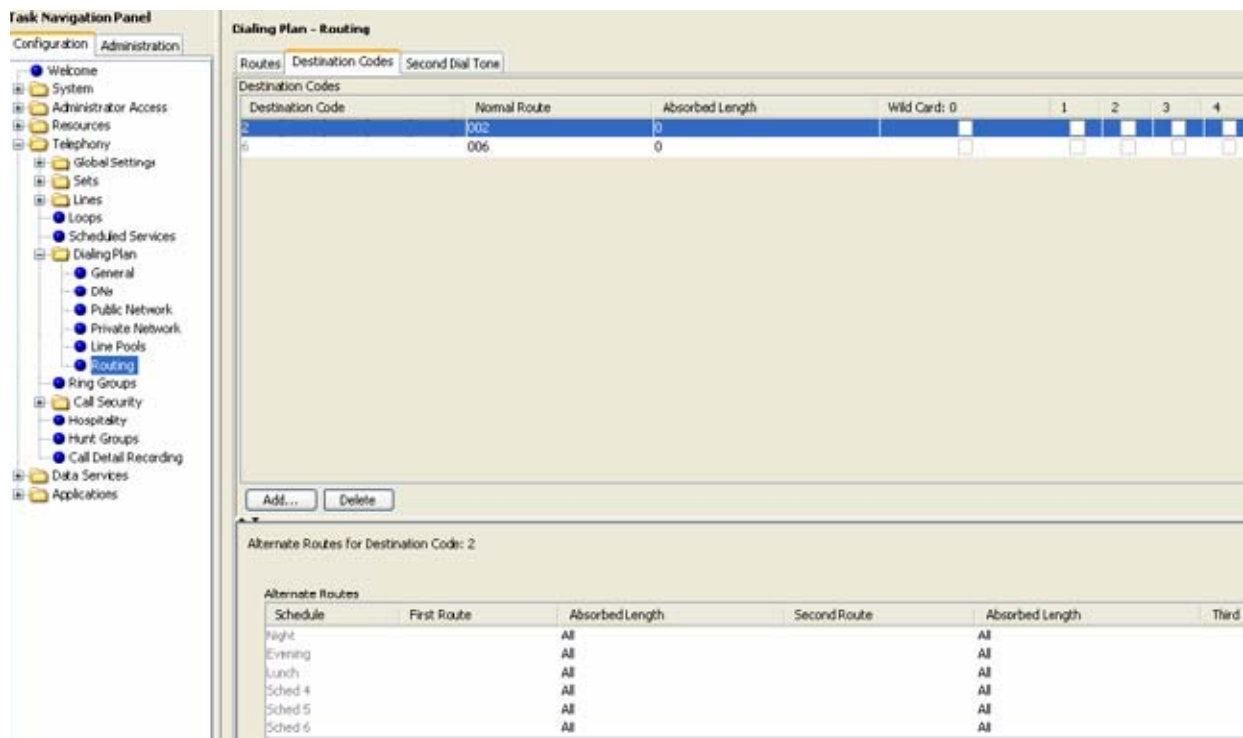


The **Dialing Plan - Routing** configuration screen shows the **Routes** tab selected. The left pane shows the navigation tree with **Routing** selected under **Dialing Plan**. The main area displays a table of routes.

Route	External Number	Use Pool	DN Type	Service Type	Service ID
000		A	N/A	N/A	N/A
002		BiccA	Private	N/A	N/A
006		BiccA	Public (Unknown)	N/A	N/A

- 8 Select **Configuration > Telephony > Dialing Plan > Routing** and select the **Destination Codes** tab. Verify that the destination code is configured correctly.

Note: Ensure that the **Absorbed Length** is configured to the expected dialing plan.



9 Select **Configuration > Telephony > Sets > Active Sets** and select the **Line Access** tab.

- 10** Highlight the appropriate set and select the **Line Pool Access** tab. Verify that the set has access to VoIP trunks

Task Navigation Panel

- Configuration
 - System
 - Administrator Access
 - Resources
 - Telephony
 - Global Settings
 - Sets
 - Entire Sets
 - Active Application DNs
 - Inactive DNs
 - All DNs
 - Lines
 - Loops
 - Scheduled Services
 - Dialing Plan
 - Ring Groups
 - Call Security
 - Hospitality
 - Hunt Groups
 - Call Detail Recording
 - Data Services
 - Applications

Active Sets

DN	Model	Name	Port	Pub. CLI	Priv. CLI	Fwd No Answer	Fwd Delay
4221	1230	Jnew	0101	4221	4221		N/A
4233	Analog	4233	0411	4233	4233		N/A
4234	Analog	4234	0414	4234	4234		N/A
4235	Analog	4235	0415	4235	4235		N/A
4236	Analog	4236	0416	4236	4236		N/A

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Details for DN: 4221

Line Assignment: Line Pool Access Answer DNs MeetMe Conferencing

Line Pools

Line Pool

ElocA ensure the set has access to the VOIP trunks

Add... Delete

- 11** Select **Configuration > Telephony > Dialing Plan > Private Network** and ensure that the **Private Network Type** is set to CDP or UDP.

Note: In this example, the dialing plan is configured for a CDP Network with the recommended minimum 4 digit Private DN length

Task Navigation Panel

Configuration Administration

- Welcome
- System
- Administrator Access
- Resources
- Telephony
 - Global Settings
 - Sets
 - Active Sets
 - Active Application DN
 - Inactive DNs
 - All DNs
 - Lines
 - Loops
 - Scheduled Services
 - Dialing Plan
 - General
 - DNs
 - Public Network
 - Private Network**
 - Line Pools
 - Routing
 - Ring Groups
 - Call Security
 - Hospitality
 - Hunt Groups
 - Call Detail Recording
- Data Services
- Applications

Dialing Plan - Private Network

Private Network Settings

Private Received number length: 4

Private network type: CDP

Private Auto DN:

Private DISA DN:

Private access code:

Private network ID: 3

Location code:

Private DN length: 4

MCDN

Local access code:

National access code:

Special access code:

Network ICCL: ☒

TRO: ☒

TAT: ☒

VoIP

Virtual Private Network ID: 0

Zone ID: 0

ETSI

Network Diversion: ☐

MCID: ☐

Example 3: IP set is not registering with the BCM450

When an IP set cannot register with the BCM450, you may notice the following problem in your network:

- the IP set is not registered and repeatedly tries to connect to the BCM450

If an IP phone is not registering with the BCM450, there are three possible causes:

- there are not enough licenses for the number of IP phones connected to the system
- the number of IP sets connected exceeds the maximum; the maximum is 300
- the phone is not correctly configured

Verify that the number of phones does not exceed the number of licenses. If there are too many phones for the number of licenses, disconnect any unnecessary phones, or increase the number of licenses.

If the number of IP sets connected to the BCM450 exceeds the maximum number of 300, it is possible that after a system reboot, not all of the 300 supported sets will be able to register. To resolve this problem, refer to the procedure [Troubleshooting example 3a](#) on page 59.

If the number of phones connected does not exceed the number of licenses, and does not exceed the maximum number of IP sets supported, use the procedure [Troubleshooting example 3b](#) on page 59 to verify the configuration of the IP phone.

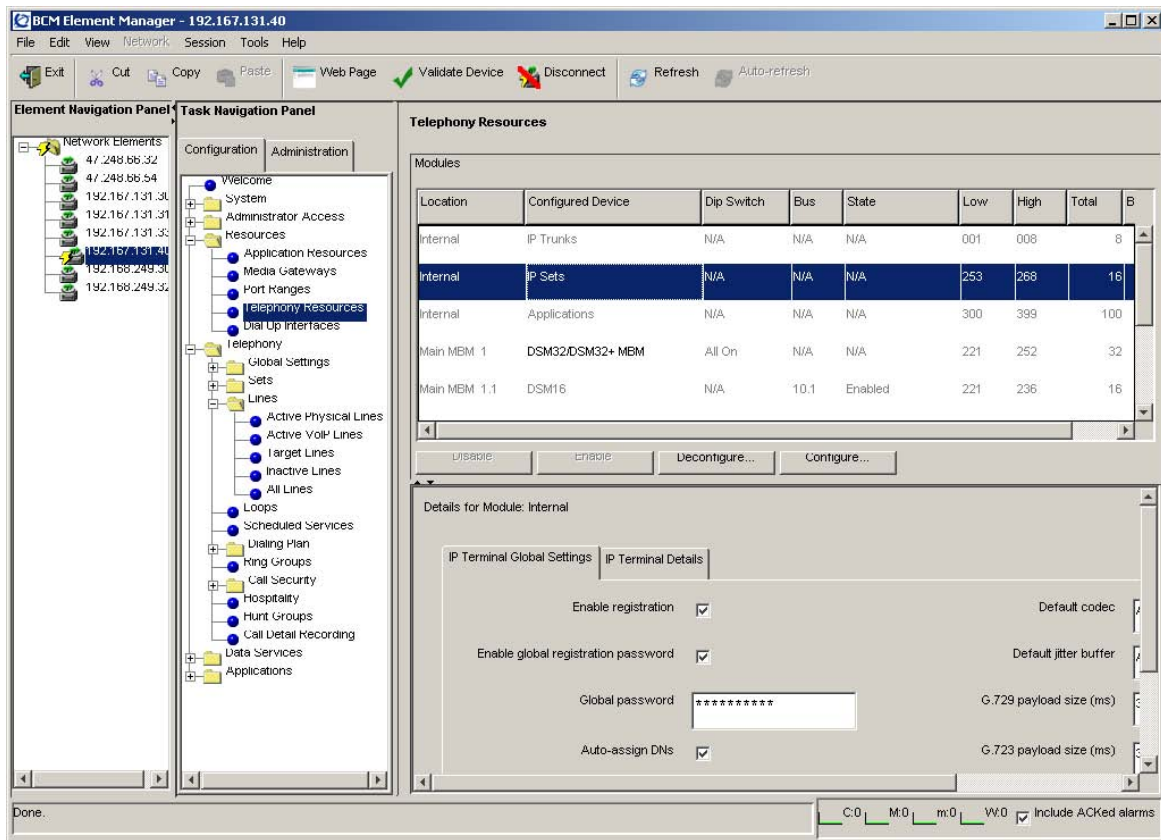
Troubleshooting example 3a

- 1 Select **Configuration > Telephony Resources** deregister the offline sets.
OR
- 2 To connect more than 300 IP sets, configure unused Application DNs for these sets by selecting **Configuration > Telephony Resources > Application Sets**.
- 3 Decrease the Application DNs and increase the IPSet DN count.

Troubleshooting example 3b

- 1 Select **Configuration > Resources > Telephony Resources** and select the appropriate IP set from the list.
- 2 On the **IP Terminal Global Settings** tab, ensure that the **Enable Registration** checkbox is selected.
- 3 Verify that the Global password on the BCM450 is the same password that you are using to register the IP set (the default password is 2264). If this field is left blank, no password prompt occurs during phone registration.

4 Verify S1/S2 IP address & Port settings on phone (Port 7000 for BCM)



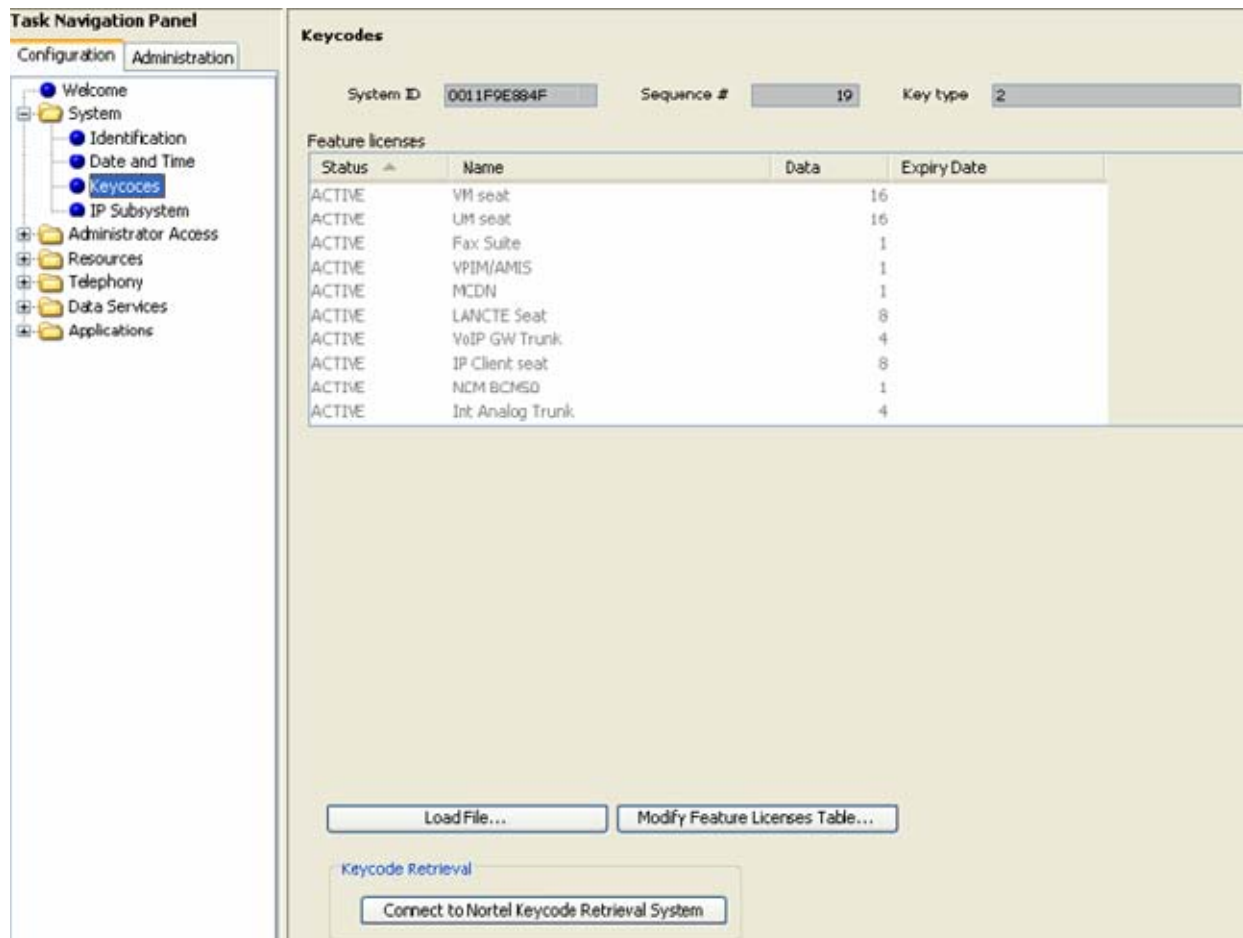
Example 4: Cannot install keycode or invalid keycode application

When you cannot install a keycode, or have an invalid keycode application, you will see the following message: "Error Happened. Error detail; Invalid Keycode File."

Use the following procedure when you cannot install a keycode, or when a keycode application is invalid. For further information about keycodes, see the *Keycode Installation Guide* (NN40010-301).

Troubleshooting example 4

- 1 Verify that the keycode is generated against the right system ID in the Keycode Retrieval System (KRS). Access the KRS using one of the following methods:
 - a Connect to <http://www.nortel.com/support/tools/krs/>
 - b In Element Manager, select **Configuration > System > Keycodes** and click the **Connect to Nortel Keycode Retrieval System** button.



- 2 In the Element Manager, select **Help > About**. Verify that the installed version is the latest version of the software.

Example 5: Cannot dial out from digital trunk

When you cannot dial out from a digital trunk, you may experience the following problems in your network:

- you are unable to reach a destination number when you dial it
- there is no route to the destination

Use the following procedure when you cannot dial out from a digital trunk.

Troubleshooting example 5

- 1 Check that the LED indicators on the BCM Chassis are solid green.
- 2 Verify the physical connection from the carrier demarcation; ensure that the cable is securely connected.
- 3 Verify the physical connection from the carrier demarcation to the BCM450 equipment; ensure that the cable is securely connected.
- 4 If you are using SL-1 or ETSI QSIG, verify that the MCDN keycode is active. From the Element Manager, select **Configuration > System > Keycodes** to view the list of installed features.

Task Navigation Panel

Configuration Administration

- Welcome
- System
 - Identification
 - Date and Time
 - Keycodes
 - IP Subsystem
- Administrator Access
- Resources
- Telephony
- Data Services
- Applications

Keycodes

System ID: 0011F0E884F0 Sequence #: 20 Key type: 2

Feature licenses

Status	Name	Data	Expiry Date
ACTIVE	VM seat		16
ACTIVE	UM seat		16
ACTIVE	Fax Suite		1
ACTIVE	VPIM/AMIS		1
ACTIVE	MCDN		1
ACTIVE	LANCTE Seat		8
ACTIVE	VoIP GW Trunk		4
ACTIVE	IP Client seat		8
ACTIVE	NCM BCM50		1
ACTIVE	Int Analog Trunk		4

- 5 Verify that the digital trunk parameters are configured according to the parameters specified by your carrier or central office.
- 6 Select **Configuration > Resources > Telephony Resources** and click the **Trunk Port Details** tab. Verify that the trunk port details and state are correctly provisioned.

7 Select the **Provision Lines** tab and verify that the lines are correctly provisioned.

Task Navigation Panel

- Configuration
 - System
 - Administrator Access
 - Resources
 - Application Resources
 - Media Gateways
 - Port Ranges
 - Telephony Resources**
 - Dial Up Interfaces
 - Telephony
 - Data Services
 - Applications
- Administration

Telephony Resources

Location	Module type	Bus	State	Devices	Low	High	Total	Busy
Internal	IP Sets	1	N/A	Sets	N/A	N/A	22	0
Internal	IP Trunks	N/A	N/A	Lines	1	12	12	0
Internal	Analog Trunk	3	Enabled	Lines	61	64	4	0
Internal	Sets	4	Enabled	Sets	N/A	N/A	9	0
Expansion 1	UNI-FRM	0	Disabled	Lines	00	31	43	0
Expansion 2	Empty	7	N/A	N/A	N/A	N/A	N/A	N/A

Disable Enable

Details for Module: Expansion 1

Trunk Module Parameters Trunk Port Details Provision Lines

Trunk type: PRI

Protocol: SL-1

Protocol type: User (Slave)

B channel selection: Descending Sequential

Clock source: Primary external

Send name display: ☒

Remote capability MWE: ☒

Maximum transits: 31

T1 Parameters:

CO fail: TIA-547A

Interface levels: SDN

Framing: ESF

Line coding: B8ZS

Internal CSU: ☒

CSU line build: 0 dB

8 Select **Configuration > Telephony > Dialing Plan > Routing** and select the **Routes** tab. Verify that the route is configured correctly

Task Navigation Panel

- Configuration
 - System
 - Administrator Access
 - Resources
 - Telephony
 - Global Settings
 - Sets
 - Lines
 - Loops
 - Scheduled Services
 - Dialing Plan
 - General
 - DNs
 - Public Network
 - Private Network
 - Line Pools
 - Routing**
 - Ring Groups
 - Call Security
 - Hospitality
 - Hunt Groups
 - Call Detail Recording
 - Data Services
 - Applications
- Administration

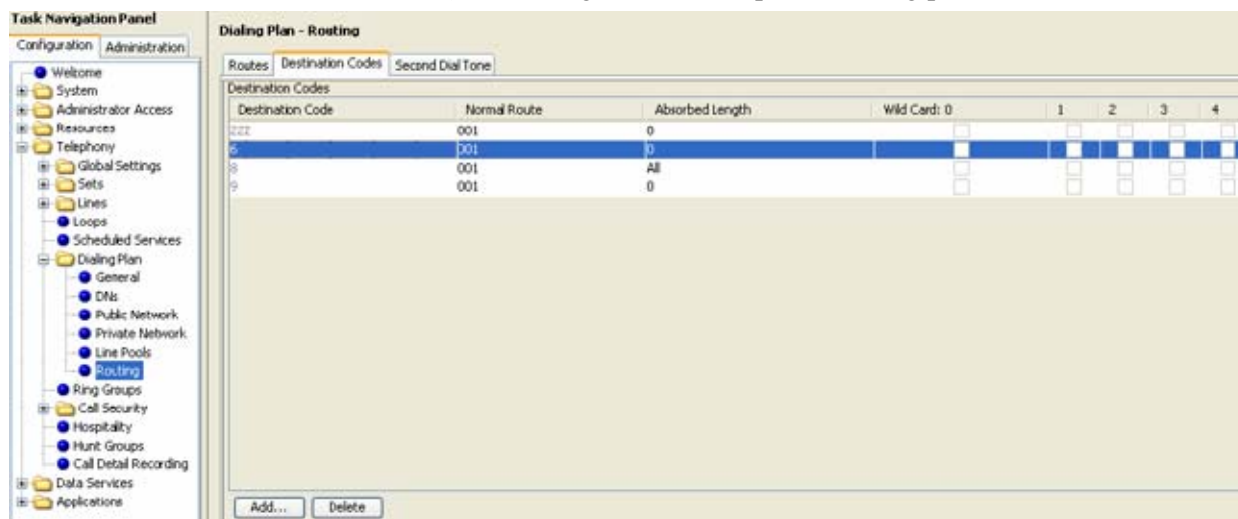
Dialing Plan - Routing

Routes Destination Codes Second Dial Tone

Route	External Number	Use Pool	DN Type	Service Type	Service ID
000		A	N/A	N/A	N/A
001		Block	Public (Unknown)	N/A	N/A

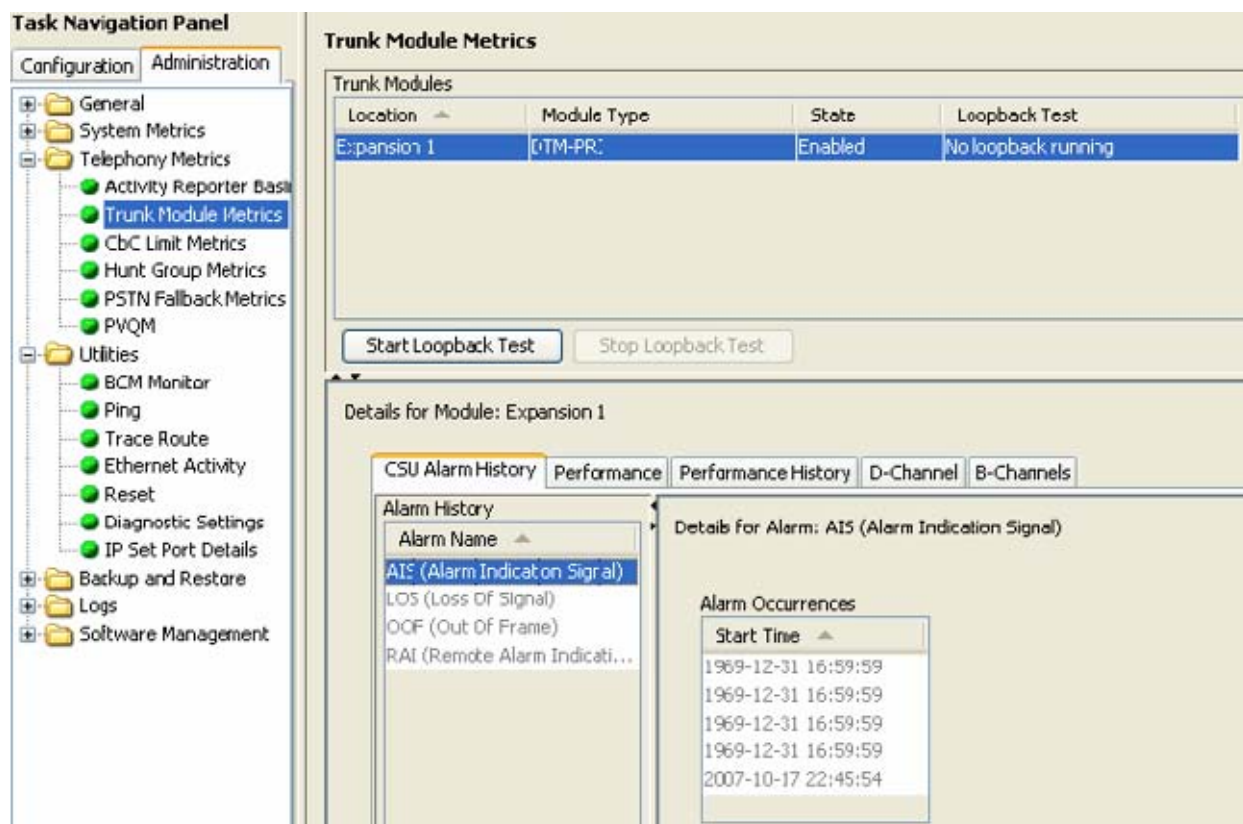
9 Select **Configuration > Telephony > Dialing Plan > Routing** and select the **Destination Codes** tab. Verify that the destination code is configured correctly.

Note: Ensure that the **Absorbed Length** is configured to the expected dialing plan.

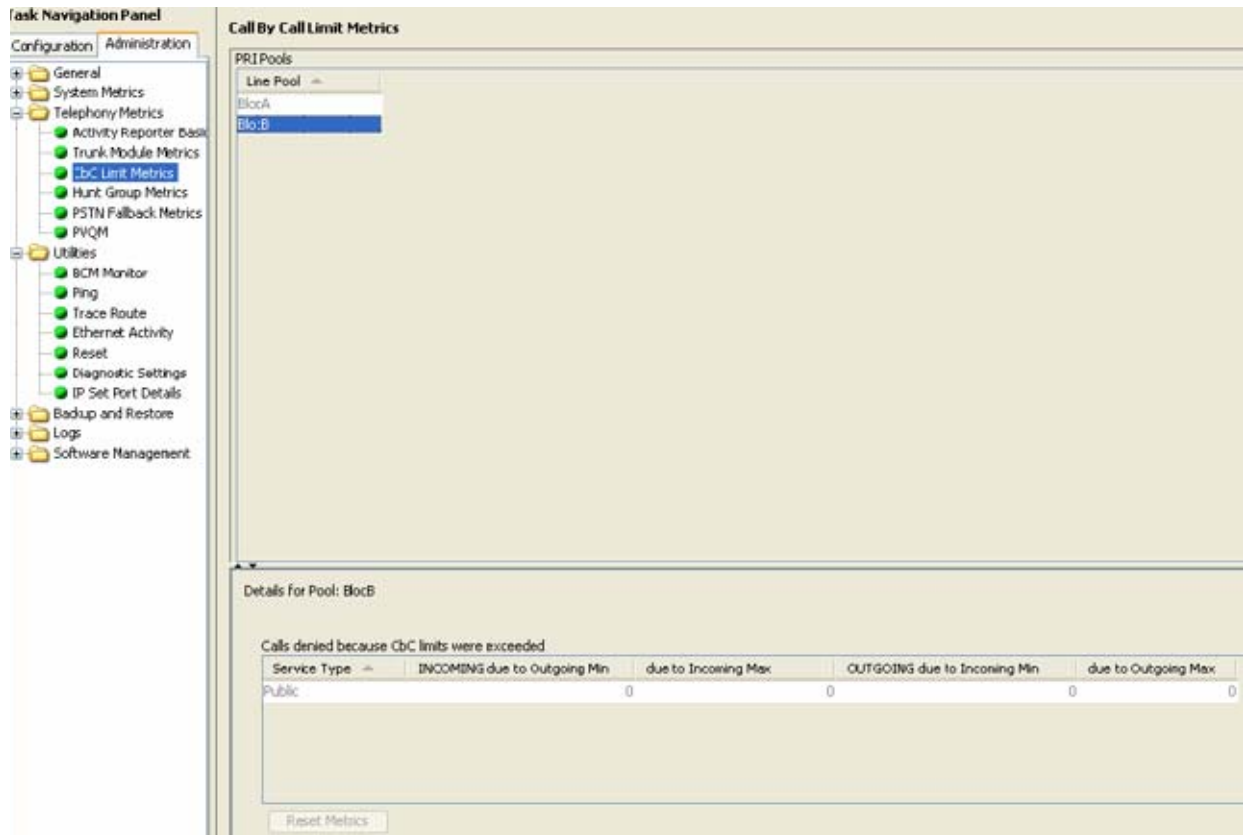


10 Select **Administration > Telephony Metrics > Trunk Module Metrics** and select the DTM module. Verify that the State of the DTM module is Enabled.

11 Select the **CSU Alarm History** tab and check the alarm status of the module.

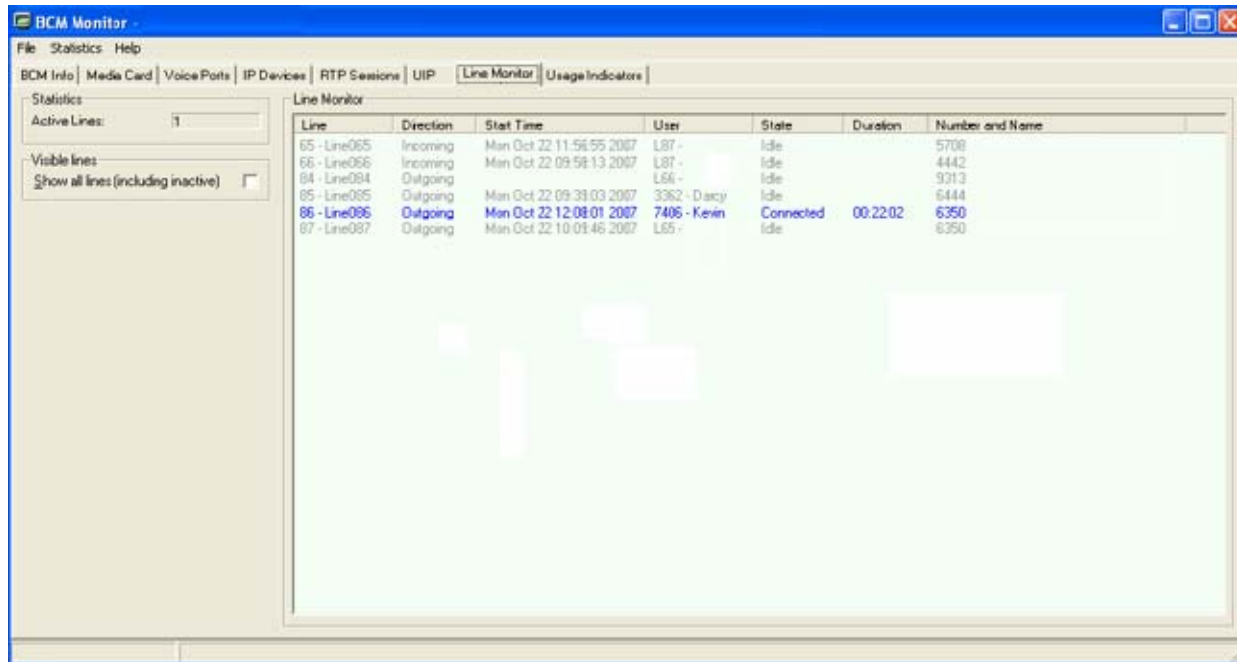


- 12** Select **Administration > Telephony Metrics > CBC Limit Metrics** and verify calls were not denied due to exceeding CBC limits.



- 13** Select **Administration > Utilities > BCM Monitor** and click the **Launch BCM Monitor** button.

- 14** Select the **Line Monitor** tab and verify the status of the line; select the **UIP** tab and verify the call set up.

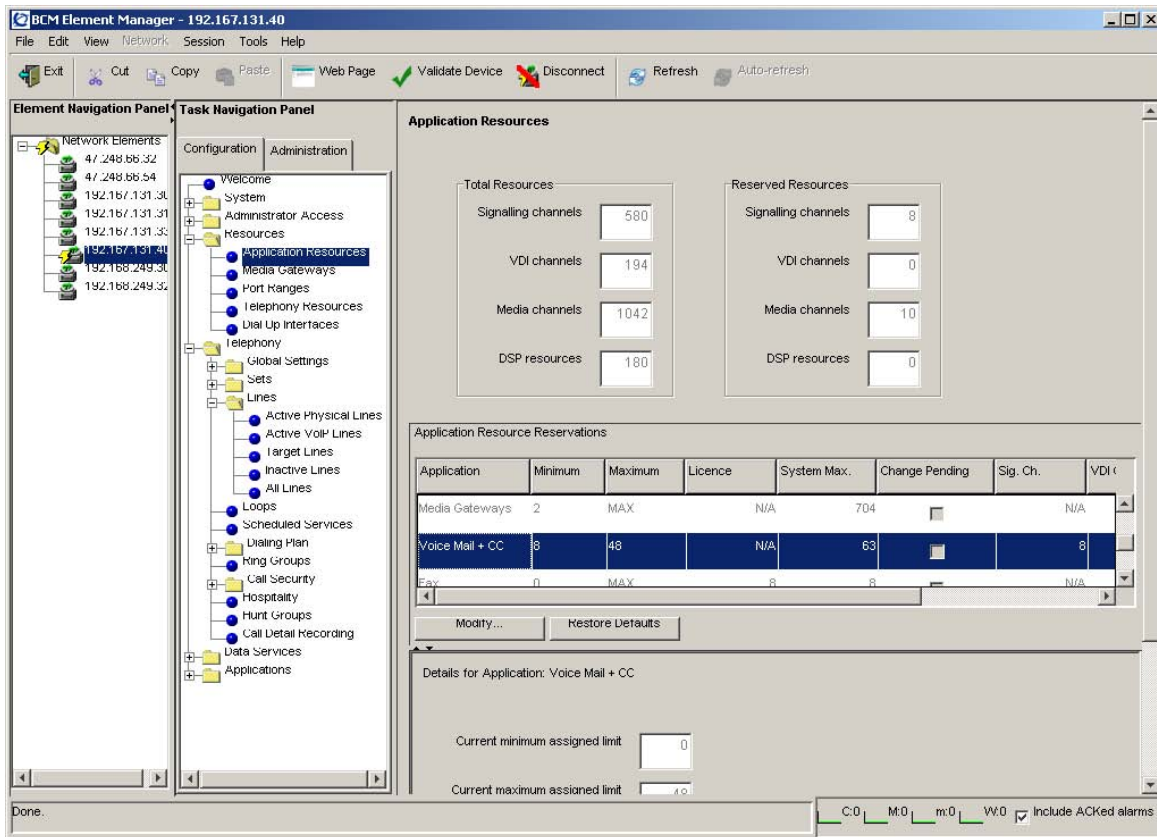


Example 6: MeetMe Conferencing commands do not work, or conferencing is busy

Use the following procedure to troubleshoot problems with MeetMe Conferencing.

Troubleshooting example 6

- 1 Select **Configuration > Resources > Application Resources** and select the **VoiceMail + CC** application.
- 2 Increase the maximum number of application resources (voice ports) for **Voice Mail + CC**.



Example 7: Unable to apply a software update from a USB storage device

Use the following procedure when a software update from a USB storage device fails. When the update fails, the BCM450 generates alarm 1003.

Troubleshooting example 7

- 1 Verify that only one USB storage device is attached to the BCM450 in the bottom USB port.
- 2 If a second USB storage device is attached, remove it.
- 3 Verify that there is only one partition on the USB storage device, and that the software update is on the first partition. The BCM450 will recognize only the first partition.

Example 8: Element Manager incorrectly shows expansion cabinet as empty

Use the following procedure when a module is installed in the expansion cabinet, but the Element Manager shows the expansion cabinet as empty, and the MBM is not active.

- 1** Select **Configuration > Resources > Telephony Resources**.
- 2** Double-click the **Module Type** field for the expansion cabinet.
- 3** Select the module from the list.
- 4** Configure the module and select **Enable**.

Chapter 6

Recovery trees

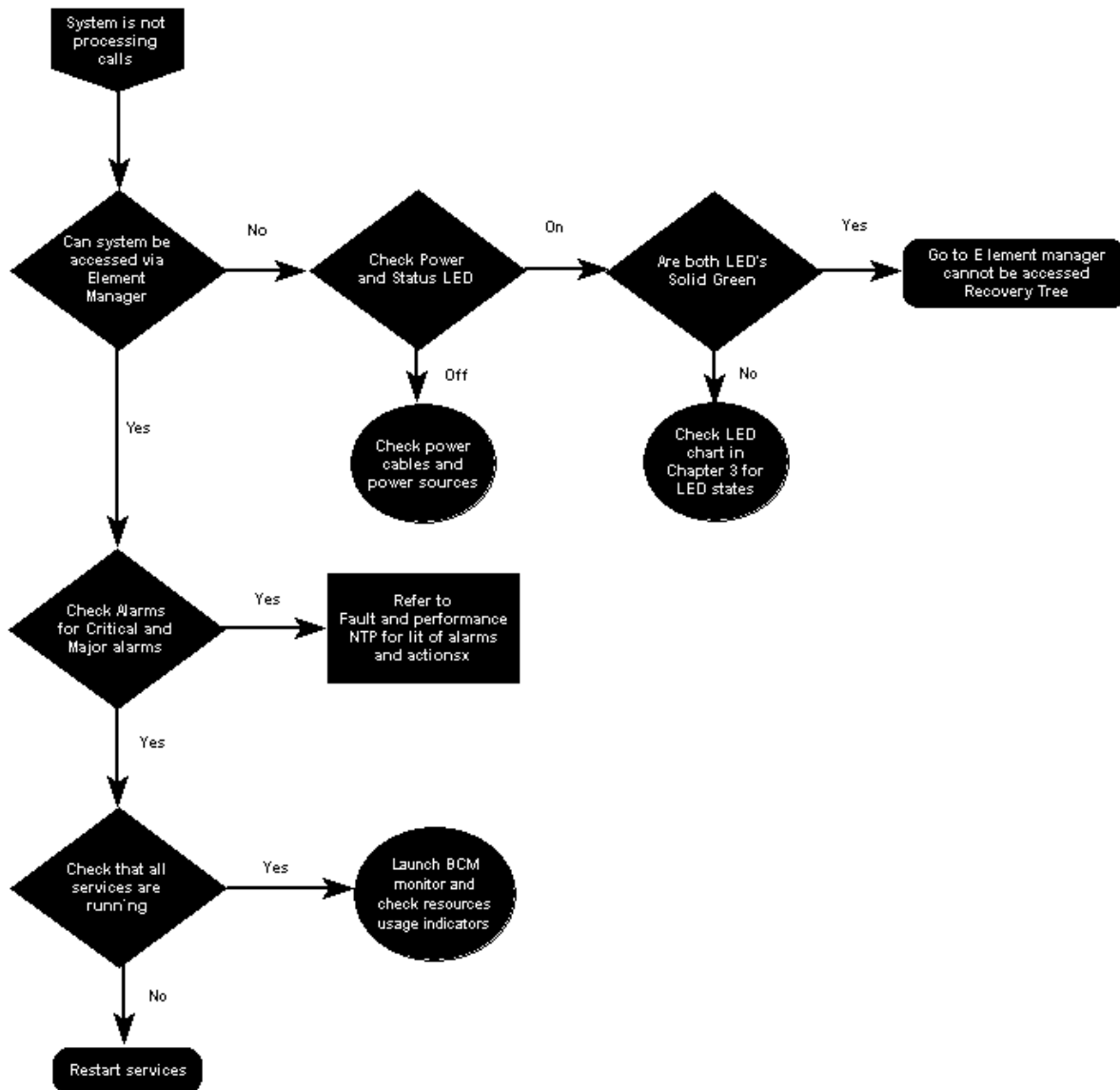
The chapter provides recovery trees for common troubleshooting scenarios.

Navigation

- [System is not processing calls](#) on page 69
- [Start-up profile fails](#) on page 70
- [Cannot access BCM450 through Element Manager](#) on page 71
- [BCM450 shuts down unexpectedly](#) on page 73

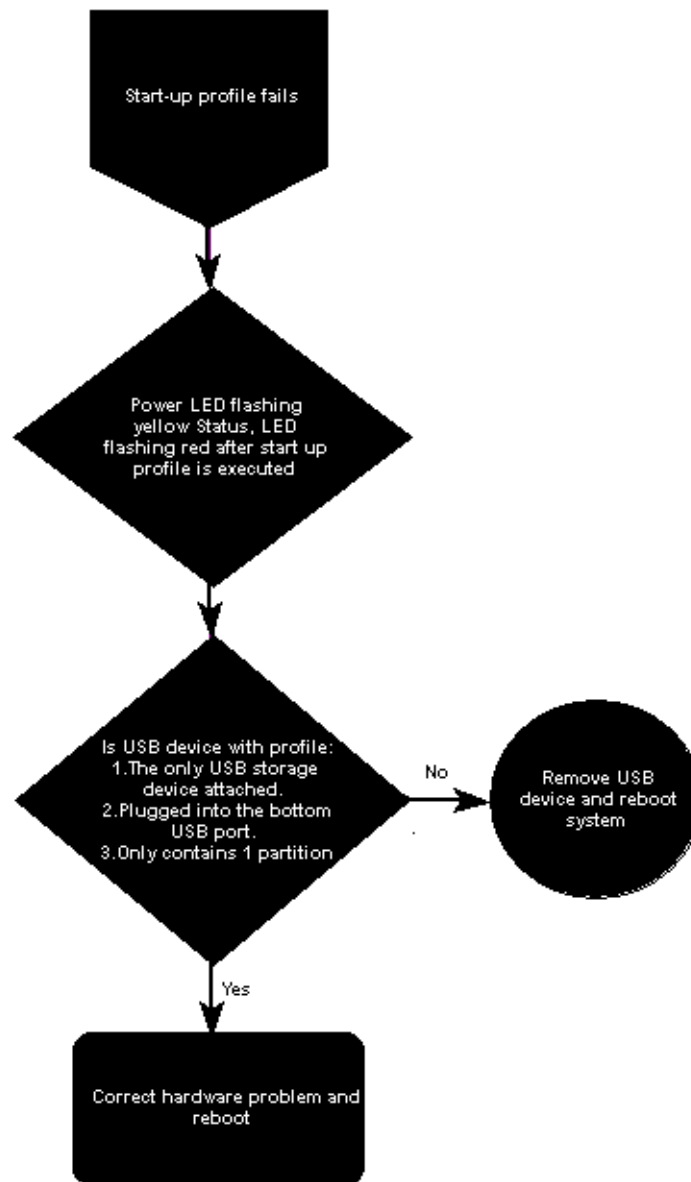
System is not processing calls

Use the following flowchart when the BCM450 is not processing calls.

Figure 12 System is not processing calls

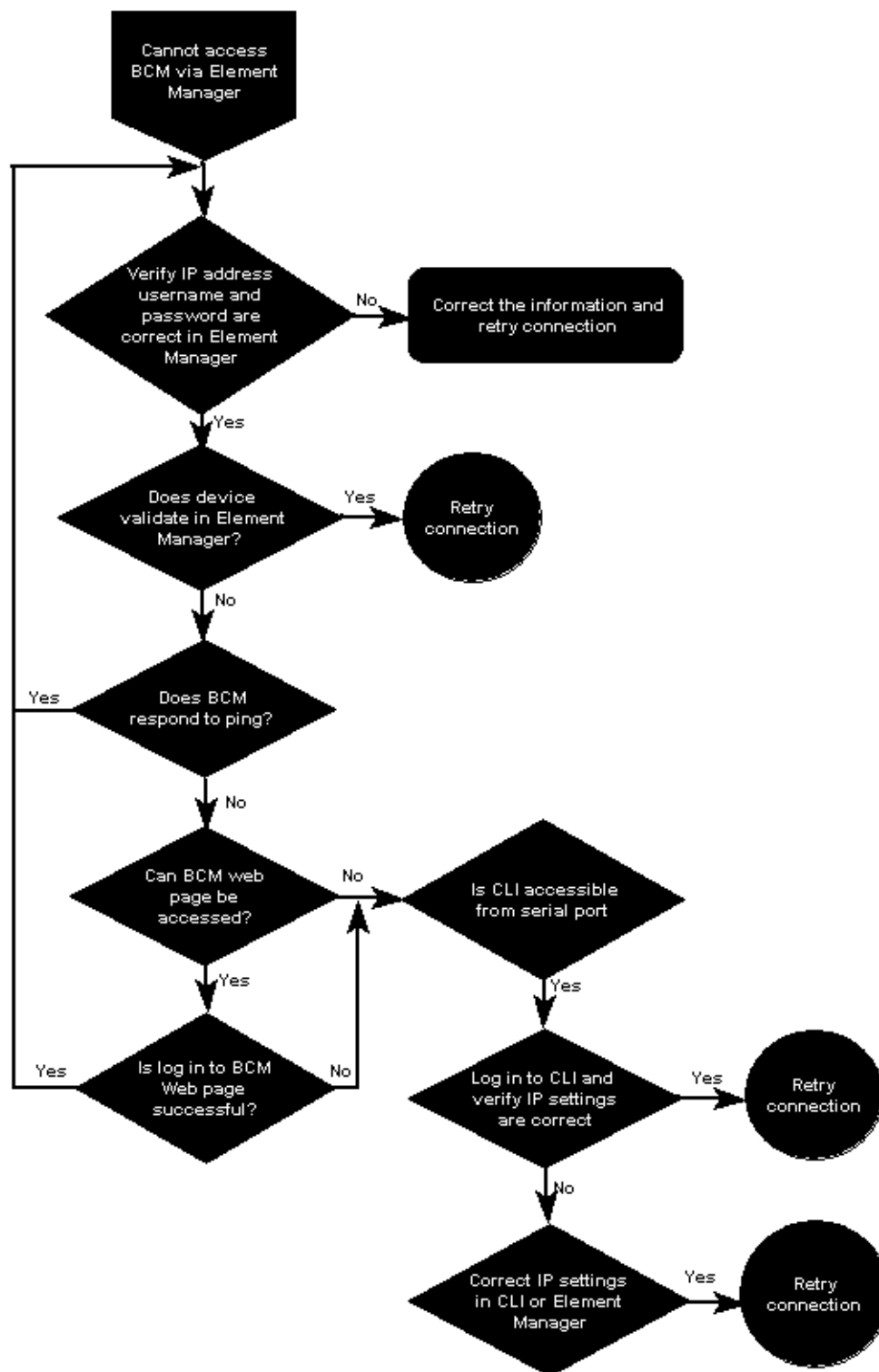
Start-up profile fails

Use the following flowchart when the start-up profile of the BCM450 fails.

Figure 13 Start-up profile fails

Cannot access BCM450 through Element Manager

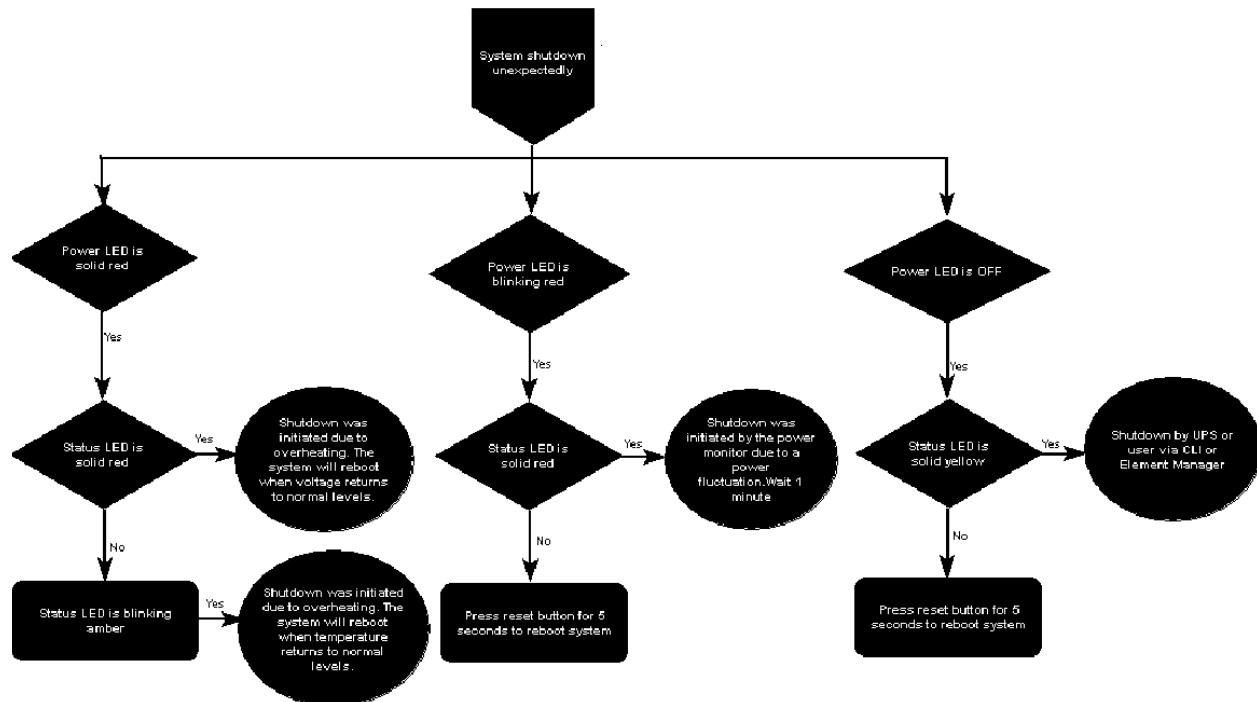
Use the following flowchart when you cannot access the BCM450 through Element Manager.

Figure 14 Cannot access BCM450 through Element Manager

BCM450 shuts down unexpectedly

Use the following flowchart when the BCM450 shuts down unexpectedly.

Figure 15 Unexpected shutdown



Chapter 7

Downloading Software

Use the information in this chapter to download BCM450 software.

Navigation

- [Downloading software from the BCM450 webpage](#) on page 75
- [Downloading software from the Nortel web site](#) on page 77

Downloading software from the BCM450 webpage

The BCM450 web page facilitates the download of applications, documentation, and other information necessary for running the BCM450 and its services. You connect to the BCM450 web page by typing the IP address of your BCM450 device into your browser. A valid user name and password are required in order to access the web page.

The BCM450 web page contains the following links:

- Quick Link - Provides links to frequently used applications, including Mailbox Manager, Activity Reporter Basic, and CallPilot Manager.
- User Applications - Applications listed in Table 12 that are available to the end users of the BCM450.
- Business Applications - Applications listed in Table 12 that are available to business users of the BCM450.
- Administrator Applications - Applications listed in Table 12 that are available to BCM450 administrators.
- Documentation - Documentation for the BCM450 end users to explain the end-user applications and BCM450-specific tasks.

Table 12 Applications available on BCM450 web page

Application	User	Administrator
User Applications		
Mailbox Manager	Y	Y
Desktop Assistant Pro	Y	Y
CallPilot Unified Messaging	Y	Y
Personal Call Manager	Y	Y
LAN CTE Client	Y	Y
IP Software Phone 2050*	Y	Y
Mobile Voice Client 2050	Y	Y

Table 12 Applications available on BCM450 web page (Continued)

Application	User	Administrator
Business Applications		
Reporter Applications		
Activity Reporter Basic	N	Y
Activity Reporter	N	Y
Contact Center Applications		
Reporting for Contact Center	N	Y
Contact Center Reporting Server	N	Y
Multimedia Contact Center	N	Y
IP View Softboard	N	Y
Administrator Applications		
Administrator Management Tools		
CallPilot Manager	N	Y
Business Element Manager	N	Y
Desktop Assistant Pro AE	N	Y
NCM for BCM	N	Y*
BCM Monitor	N	Y
CDR Clients	N	Y
BCM MIBs	N	Y
RADIUS Dictionary		
SSH Client (PuTTY)	N	Y
BCM Logs	N	Y
Digital Mobility Tools		
Digital Mobility Controller	N	Y
Digital Mobility Service Tool	N	Y
Templates		
Startup Profile Template	N	Y
Factory Default Programming Record	N	Y

To download software from the BCM450 webpage

1 Connect to the BCM450 web page:

- If the BCM450 is installed on the network use a browser and type in the BCM450 IP address as the URL in the following format:

http://xxx.xxx.xxx.xxx

- If the BCM450 is installed but not yet configured, connect directly to the BCM450 through the OAM port and, using a browser, type the following:

<http://10.10.11.1/>

- 2 Enter the user name and password to be authenticated on the BCM450 web page.
- 3 Select the link for the type of application that you want to download.
- 4 Select the link for the specific application or tool that you want to download and select the download link.

Downloading software from the Nortel web site

To download software from the Nortel Web site, see the following web site:

<http://www.nortel.com/downloadingcontent>

Chapter 8

Troubleshooting Tools

The BCM450 system provides several tools that you can use to diagnose problems.

Navigation

- [Service Management](#) on page 79
- [Status and Metrics](#) on page 79
- [Utilities](#) on page 80
- [Command Line Interface](#) on page 80

Service Management

You can use the Element Manager to view a list of the services that are running on your BCM450 system.

For information about service management on the BCM450, see “Using the BCM450 Service Management System” in the *BCM450 Administration and Security Guide* (NN40160-601).

Status and Metrics

You can use the Element Manager to view detailed information about the performance of the BCM450 and about the performance of system resources.

You monitor system status using the following tools:

- QoS Monitor—QoS Monitor monitors the quality of service (QoS) of IP trunk services.
- UPS Status—The Uninterruptible Power Supply (UPS) feature provides monitoring of the power source and the battery backup.
- NTP Metrics—The Network Time Protocol (NTP Metrics) feature provides an overview of the integrity of the NTP time source

For information about monitoring the system status, see the chapter “Using BCM450 System Metrics” in the *BCM450 Administration and Security Guide* (NN40160-601).

You can monitor system performance using the following tools:

- Activity Reporter Basic—Generate reports about call activity and voice mail receive statistics.
- Trunk Module Metrics— View the status of digital trunk modules as well as identify any device or lines connected to the system.
- CbC Limit Metrics—Use the CbC Limit metrics panel to monitor denied call activity for each service on each line pool.

- **Hunt Group Metrics**—Access the Hunt Group metrics to evaluate total call processing by hunt group member.
- **PSTN Fallback Metrics**—View how many fallback attempts and fallback failures occur within a specific period using the PSTN Fallback Metrics panel.
- **Proactive Voice Quality Management**—Proactive Voice Quality Management (PVQM) metrics allow you to monitor the quality of VoIP calls. You can also use the PVQM metrics to diagnose infrastructure problems in your network.

For information about monitoring system performance, see the chapter “Monitoring BCM450 Telephony Metrics” in the *BCM450 Administration and Security Guide* (NN40160-601):

Utilities

BCM450 provides the following utilities:

- **BCM Monitor**—BCM Monitor is a stand-alone diagnostic application that the system administrator can use to view real-time system and IP telephony information about BCM450 systems.
- **Ping**—Ping (Packet InterNet Groper) is a utility that you can use to verify that a route exists between the BCM450 and another device.
- **Route trace**—You can use Trace Route to measure round-trip times to all hops along a route. This helps you to identify bottlenecks in the network.
- **Ethernet activity**—The Ethernet Activity panel is a utility that you can use to view ethernet activity in the BCM450 system.

For information about utilities, see the “BCM450 Utilities” chapter in the *BCM450 Administration and Security Guide* (NN40160-601).

Command Line Interface

You can use the Command Line Interface (CLI) to configure basic settings, as well as shut down, reboot, or reset the BCM450 system. Two CLI modes are available: Maintenance CLI, and Configuration CLI.

This section contains information about the following topics:

- [Accessing the CLI](#) on page 80
- [Using the Configuration CLI](#) on page 81
- [Using the Maintenance CLI](#) on page 82

Accessing the CLI

There are two methods of accessing the CLI:

- through a serial connection
- through the OAM port

For either method, your user account must be assigned the System-CLI privilege before you can access the CLI.

Accessing the CLI through a serial connection



Caution: The CLI is intended for use by experienced technicians, or as directed by Nortel Technical Support. Improper use of the CLI may result in data loss.

- 1 Connect a serial cable with a 9-pin female connector from the serial port on a PC to the serial port on the BCM450.
- 2 Ensure that you use the following settings:
 - bits per second: 115200
 - data bits: 8
 - parity: N
 - stop bits: 1
 - no flow control
- 3 Use a terminal emulation program, such as Hyperterminal or Nortel CLI Manager, to establish a connection to the BCM450.
- 4 Log into the BCM450 by entering your username and password. Your user account must be assigned the System-CLI privilege in order to access the CLI.

Accessing the CLI through the OAM port



Caution: The CLI is intended for use by experienced technicians, or as directed by Nortel Technical Support. Improper use of the CLI may result in data loss.

- 1 Connect an Ethernet cable from the Ethernet port on a PC to the OAM Ethernet port on the BCM450.
- 2 Set the IP address of the PC to 10.10.11.2.
- 3 Use putty to establish an SSH connection to the default IP address of the OAM port: 10.10.11.1.
- 4 Log into the BCM450 by entering your username and password. Your user account must be assigned the System-CLI privilege in order to access the CLI.

Using the Configuration CLI

The Configuration CLI displays when the system is in Main OS mode. The options available on the Configuration CLI are:

- **0—Exit.** The system exits the CLI to the login prompt.
- **1—Reboot.** The system reboots to the Main OS.

- **2—Shutdown.** The system shuts down. You need physical access to the BCM450 hardware to restart the system.
- **3—Safe OS.** The system reboots to the Safe OS and waits 1 minute for you to login. When you login within 1 minute, the Maintenance CLI displays. If you do not login within 1 minute, the system changes to the Main OS. For more information about the Safe OS, see [Using the Maintenance CLI](#) on page 82.
- **4—Configuration Reset.** A Level 1 reset occurs. The system resets all configuration data to the factory defaults.
- **5—Software Reset.** A Level 2 reset occurs. The system resets all configuration data and software to the factory defaults.
- **6—IP Configuration.** You can configure the following basic IP settings:
 - 0—Return to Previous Menu. The system returns to the main menu.
 - 1—Hostname. Provision the hostname of the system.
 - 2—IP Address. Provision the IP address of the system.
 - 3—Subnet Mask. Provision the subnet mask for the IP address.
 - 4—Default Gateway. Provision the default gateway for the system.
 - 5—DHCP Client Mode. Enable or disable the DHCP client.
 - 6—Commit Changes. Save changes to the IP settings.
 - 7—Reload Settings. Reload the existing IP settings.

Using the Maintenance CLI

The Maintenance CLI displays when the system is in Safe OS mode. The Safe OS is a diagnostic mode that you can use if the Main OS is experiencing problems. No applications or telephony services are running when the BCM450 is in Safe OS mode. The options available on the Maintenance CLI are:

- **0—Exit.** The system exits to the Safe OS login prompt.
- **1—Reboot into Main OS.** The system reboots to the Main OS.
- **2—Shutdown.** The system shuts down. You need physical access to the BCM450 hardware to restart the system.
- **3—Reboot into Safe OS.** The system reboots to the Safe OS and waits 1 minute for you to login. If you do not login within 1 minute, the system changes to the Main OS.
- **4—Transition to Main OS.** The system changes from the Safe OS to the Main OS without restarting.
- **5—Configuration Reset.** A Level 1 reset occurs. The system resets all configuration data to the factory defaults.
- **6—Software Reset.** A Level 2 reset occurs. The system resets all configuration data and software to the factory defaults.

Chapter 9

Understanding system messages

The BCM450 system generates alarms, logs, traps, and other system messages that you can use to troubleshoot problems.

Alarms, logs, and traps

For information about system messages, see the following chapters in the BCM450 Fault and Performance Management Guide (NN40160-701):

- “Using the BCM450 Fault Management System,” which describes fault management tools such as alarms, logs, and SNMP traps
- “List of Alarms,” which provides alarm messages, problem descriptions, and possible solutions

Reporting for dropped calls

You can specify the level of system reporting that you require for released ISDN or VoIP calls. You can choose to have no text, a simple explanation, or a detailed explanation in the dropped call notification.

Use this procedure to set the level of reporting for dropped calls.

To set Release Reasons

To set Release reasons, follow these steps:

- 1 Click **Administration > Utilities > Diagnostic settings**.
- 2 Click the **Telephony** tab.
The **Release Reasons** panel appears.
- 3 From the Release Reason drop-down menu, select the level of reporting that you require. Table 13 lists the possible values for Release reasons.

Table 13 Release reasons

Attributes	Values	Description
None	Default Value	No text will accompany a dropped call notification.
Simple	Cause Code: Off On	Off: no text is provided On: the code only is provided Note: if you select Simple text, you must turn off the Cause code. This is for diagnostic purposes only.

Table 13 Release reasons

Attributes	Values	Description
Detailed	No setting	A detailed explanation of the Cause code is provided.
Cause Code	check box	This check box appears when you select Simple in the Release Reason Text drop-down menu. When you select the check box, only the cause code accompanies a dropped call notification.

Chapter 10

Useful Troubleshooting Links

Use the information in this chapter to find additional reference information when you are troubleshooting a problem with the BCM450 system. As part of your initial troubleshooting, Nortel recommends that you check these resources for information about known issues and for solutions related to the problem you are experiencing.

Navigation

- [Partner Bulletins](#) on page 85
- [Knowledge and Solution Engine](#) on page 85

Partner Bulletins

To locate Partner Bulletins, visit the Nortel Partner Information Center:

<http://www.nortel.com/pic>

Knowledge and Solution Engine

The Knowledge and Solution Engine allows you to search an entire database of Nortel technical documents, troubleshooting solutions, software, and technical bulletins.

The document types available from the Knowledge and Solution Engine include the following:

- **Bulletins:** Includes a listing of technical bulletins.
- **Documentation:** Includes all technical documentation written for Nortel products (such as installation guides, administration guides, release notes).
- **Service Requests:** Includes technical support cases created within the past year. The availability of service requests is based on your customer entitlement.
- **Software:** Includes software patches and software releases.
- **Solutions:** Includes troubleshooting solutions written by the Nortel Technical Support team.

When searching through the Knowledge and Solution Engine, enter a natural language query (that is, a query in the form of a statement or a question).

Using the Knowledge and Solution Engine

Use the following procedure to access the Knowledge and Solution Engine.

To use the Knowledge and Solution Engine

- 1 Go to the Nortel Web site: **www.nortel.com**
- 2 Log in using user name and password.
- 3 Select **SUPPORT & TRAINING**.
- 4 Select **ONLINE SELF-SERVICE**, and then select **Knowledge Base**.

The Online Self-Service page appears and shows the Knowledge and Solution Engine. For information on performing your search, click the **Search Tips** link.

To view an interactive tutorial for the Knowledge and Solution Engine, go to the **Help & Contact** section, click the **Help Using This Site** link and then scroll to find the **Knowledge Base** tutorial.

- 5 Enter your problem statement or question in the text box. Ensure that you leave spaces between the words in the statement or question.
- 6 From the **ALL TYPES** drop-down list, select the document type you would like to search against. The default is **ALL TYPES**, which searches on all available documents (bulletins, documentation, services requests, software, and solutions).
- 7 Click > (the arrow adjacent to the text box) or press **Enter** to start your search. The page reloads and provides the option to narrow your search by product family.

Chapter 11

Frequently Asked Questions

The chapter provides answers to frequently asked questions.

Navigation

- [Backup, restore, and reset operations](#) on page 87
- [Password protection](#) on page 89
- [Fault management](#) on page 90
- [System and status information](#) on page 91
- [Connectivity problems](#) on page 95
- [IP addresses](#) on page 96

Backup, restore, and reset operations

This section contains answers to the following questions:

- [How do I back up the database?](#) on page 87
- [How do I restore the BCM450 from a previous backup?](#) on page 88
- [How do I complete a Warm Reset or Cold Reset? Is it safe and will I lose customer data?](#) on page 88

How do I back up the database?

Use the following procedure to back up the BCM450 database.

To perform a backup

- 1 In the task panel, click the **Administration** tab.
- 2 Open the **Backup and Restore** folder, and then click **Backup**.
The **Backup** panel opens and displays the **Immediate Backup** tab. In the **Backup To** selection field, choose a destination for the backup archive.
- 3 Click the **Backup** button.
The **Backup** window opens.
- 4 In the **Optional Components** table, select or clear the check box for each component to include or exclude these components from the backup operation.
- 5 Click the **OK** button.
A warning window opens. Read the warning carefully before proceeding.

- 6 Click the **Yes** button to proceed.
A progress window opens. When the backup is complete, the **Backup Complete** message appears.
- 7 Click the **OK** button.

How do I restore the BCM450 from a previous backup?

Use the following procedure to restore the BCM450 database.

To restore data from the BCM450

- 1 In the task panel, click the **Administration** tab.
- 2 Open the **Backup and Restore** folder, and then click **Restore**.
The **Restore** panel opens. In the **Restore From** field, select the location of the backup archive to use.
- 3 Click the **Restore** button.
The **Select Components to Restore** window opens.
- 4 Select the optional components that you want to include from the backup file.
- 5 Click the **OK** button.
A warning window opens and displays information about components that will be affected by the restore operation. Read the warning carefully before proceeding.
- 6 Click the **Yes** button to proceed.
A progress window opens. When the operation is complete, the **Restore Complete** window opens.
- 7 Click the **OK** button.

How do I complete a Warm Reset or Cold Reset? Is it safe and will I lose customer data?

You can use the Reset utility in Element Manager to:

- reboot the BCM450 system
- perform a warm reset of telephony services
- perform a cold reset of telephony services
- shut down the system

For a description of the impact on the system of each of these resets, see [Reset functions](#) on page 26.

Use this procedure to perform a warm or cold reset.

Completing a warm or cold reset

- 1 Select **Administration > Utilities > Reset**, and click one of the following buttons:
 - a **Reboot BCM450 System** will restart the operating system of the BCM450
 - b **Warm Reset Telephony Services** will restart telephony services. Customer data will be retained.
 - c **Cold Reset Telephony Services** will reset telephony programming to factory defaults. Customer data will be lost.
 - d **Shutdown System** will stop all services and shut down the system. Restarting the system requires physical access to the BCM450.

Password protection

This section answers the following frequently asked question:

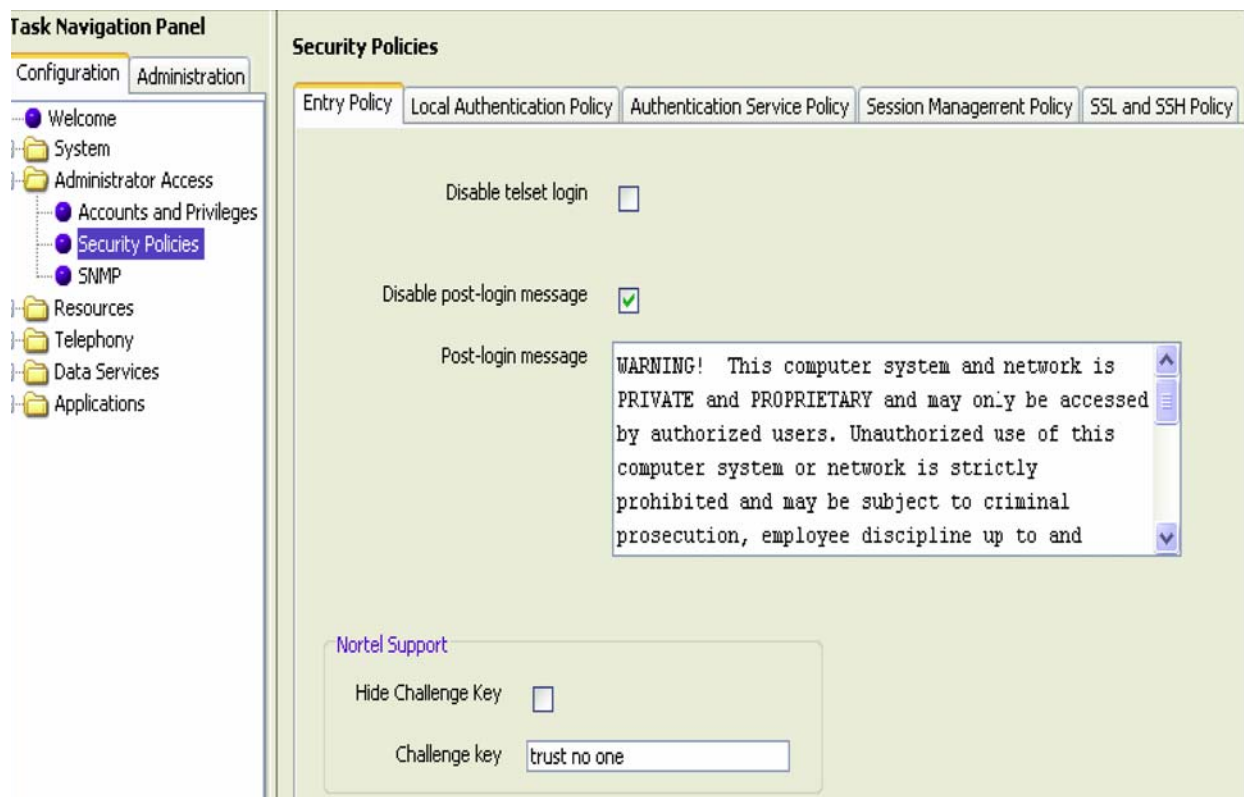
- [How do I recover a lost password for the BCM450?](#) on page 89

How do I recover a lost password for the BCM450?

There is a Nortel support default user which cannot be deleted or modified. This account is set up to allow Nortel troubleshooting technicians to access areas of the system that are not available to other users. You can change the default challenge key, but be sure to retain a record of the change so that Nortel support technicians can access your system.

Recovering a lost password

- 1 Select **Configuration > Administrator Access > Security Policies**, and select the **Entry Policy** tab.
- 2 With the **Challenge Key** available, contact Nortel Technical Support and request help to recover the lost password.



Fault management

This section answers the following frequently asked question:

- [How do I view Alarms? Can I acknowledge and clear them?](#) on page 90

How do I view Alarms? Can I acknowledge and clear them?

When you view an alarm on the alarms panel, you can change the order of the columns in the table and you can sort alarms. For example, you may want to sort alarms by Component ID and Alarm ID.

Use the following procedures to view alarms and to acknowledge alarms.

To view an alarm

- 1 Click the **Administration** tab.
- 2 Open the **General** folder, and then click the **Alarms** task.
The **Alarms** page opens.
- 3 In the Alarms Panel table, select an alarm.
The **Alarm Details** panel displays below the Alarms table.

- 4 To change the order of columns in the Alarm table, select a column and drag it left or right to the desired location, and release it.
- 5 To view a column by ascending or descending order, click the column heading.

To acknowledge an alarm

- 1 Click the **Administration** tab.
- 2 Open the **General** folder, and then click the **Alarms** task.
The **Alarms** panel opens.
- 3 In the Alarms table, select the alarm you want to acknowledge.
The **Alarm Details** panel is displayed below the Alarms table.
- 4 On the **Alarms Details** panel, click the **Acknowledge Alarm** button.
A check box appears in the **Alarm ACKed** column in the Alarms table for this alarm.

Acknowledging the alarm does not clear the alarm; it indicates only that the alarm has been noted.

System and status information

This section answers to the following frequently asked questions:

- [How do I capture the logs from the BCM450?](#) on page 91
- [How do I capture the current BCM450 configuration?](#) on page 93
- [How do I find the BCM450 system health?](#) on page 94
- [How do I show specific process states?](#) on page 94
- [How do I verify current software revision?](#) on page 94
- [How do find the BCM450 System ID and Serial Number?](#) on page 95

How do I capture the logs from the BCM450?

You can capture or transfer logs from the BCM450 using Element Manager, or from the BCM450 Web page.

When you use the BCM450 Web page to transfer log files, you cannot choose the log file categories that you will transfer; all the log files in all the categories will be transferred.

Use the following procedures to transfer log files.

Using the Element Manager to transfer log files

- 1 Click the **Administration** tab, and then open the **Logs** folder.
- 2 Click the **Log Management** task.
The **Log Management** panel opens.
- 3 Click the **Immediate Log Transfer** tab.
- 4 In the **Transfer To** selection field, select a storage location.

- 5 Click the **Transfer** button.
The **Transfer To** window opens.
- 6 Select the log file categories that you want to include in the log file transfer. All the log files associated with the selected categories will be transferred.
- 7 Click the **OK** button.
A transfer window opens and displays applicable warnings.
- 8 Click the **Yes** button to initiate the transfer.
A **Save** dialog box displays.
- 9 Specify a filename and location for the log file and click **Save**.
The **Progress Update** window opens. When the log files are transferred, the **Transfer Complete** window opens.
- 10 Click the **OK** button.
The log archive is saved in the location you specified.

Using the BCM450 Web Page to transfer log files

- 1 In your web browser, type the IP address of the BCM450 and click the **Go** button.
The login screen opens.
- 2 Log in to the BCM450 using the same username and password that you use to log into a BCM450 using the Element Manager.
The BCM450 Web page opens.
- 3 Click the **Administrators Applications** link.
- 4 Click **BCM Logs**.
- 5 Click the **Retrieve Log Files** link.
The Retrieve Log Files panel appears.
- 6 Click one of the three options for file transfer: **Transfer to My Computer**, **Store on USB Memory**, or **Send to**.
- 7 If you select the **Send to** radio button, select a destination from the drop-down list, otherwise, go to the next step.
- 8 Click Submit. The web page shows the status as **Working**; when complete, it shows **Success**.
- 9 Click the **Click Here to Download Logs** link.
The **File Download** screen opens.
- 10 Click the **Save** button.
The **Save As** screen opens.
- 11 Specify the location where you want to save the log file transfer, and enter a name for the file in the **File Name** field.
- 12 Click the **Save** button.
The file is saved.

How do I capture the current BCM450 configuration?

You can create a programming file that contains the current settings of all or part of your Element Manager data. These files can be saved in either HTML or Excel spreadsheet format. You can access the programming record in the same way you access any other HTML file or by using Excel, version 2002 or later, for the spreadsheet format.

A programming record that contains the factory default settings is available in Excel format from the BCM web page.



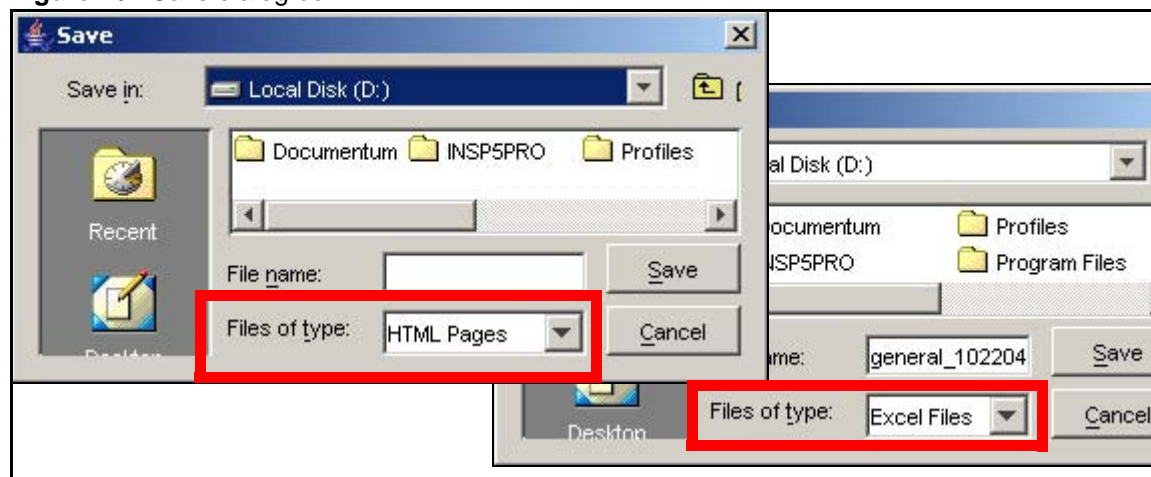
Note: It may take several hours to save programming records, depending on the size of the system. Nortel recommends that you saving programming records during periods of low system use.

Use the following procedure to capture the current programming record.

Capturing the current configuration

- 1 Select the item on the task navigation panel for which you want to save the data into an HTML report or Excel workbook. An item can be a task item, task bullet, or a folder.
- 2 Click on **Session > device IP address > Save Programming Record > Save Selected Data**. A warning dialog box appears; review the warning and click **Yes**. A **Save** dialog box then displays.

Figure 16 Save dialog box



- 3 In the **Save:** field choose the path where you want the file stored.
- 4 In the **Files of type:** field, choose the format in which you want to save the data (HTML or Microsoft Excel spreadsheet).
- 5 Enter a File name. Nortel recommends that you make the current date and system name part of the file name.

6 Click on **Save**.

Note: The **Save All Data** selection can take up to 45 minutes to complete. Your computer must stay connected to the element during this time, as the **Save All Data** function is actively writing into the file specified until the function is complete.

How do I find the BCM450 system health?

You can use the BCM Monitor to view information about system health.

The Usage Indicators tab on the BCM Monitor displays real time information about the BCM450 system, including:

- BCM450 system data, including CPU and memory use
- resources used on the Media Card, including signaling channels, media channels, voice bus channels, and DSP resources
- active telephony devices, such as IP trunks, IP sets, voice ports, and media gateways

The information is displayed as an absolute figure and as a percentage of the resource used. Use this procedure to access system health information.

Viewing the system health

- 1 Select **Administration > Utilities > BCM Monitor** and click the **Launch BCM Monitor** button.
- 1 Select the **Usage Indicators** tab.

How do I show specific process states?

Use the following procedure to view specific process states.

Viewing specific process states

- 1 Select **Administration > General > Service Manager**.
The **Service Manager** page opens. Services are displayed in the Services table.

How do I verify current software revision?

Use the following procedure to view the current software revision.

Verify the current software revision

- 1 Select **Configuration > Sytem > Identification**.

The screenshot shows the 'System Identification' configuration page. On the left is a 'Task Navigation Panel' with a tree structure. The 'Configuration' tab is selected, and the path 'System > Identification' is highlighted. The main area contains four input fields:

Model	BCM450R1
System name	bcm450
System software version	8.0.0.30.252
Country or region	North America

How do find the BCM450 System ID and Serial Number?

Use the following procedure to view the system ID and serial number.

Viewing the system ID and serial number

- 1 Select **Administration > General > Hardware Inventory**.
- 2 Select the **BCM450 System** tab.

The screenshot shows the 'Hardware Inventory' page. On the left is a 'Task Navigation Panel' with a tree structure. The 'Administration' tab is selected, and the path 'General > Hardware Inventory' is highlighted. The main area has three tabs: 'BCM System', 'Devices', and 'Additional Information'. The 'BCM System' tab is active, showing details for the 'BCM Main Unit'.

System	Nortel Business Communications Manager	Type	chassis
System name	bcm450	System ID	BBcxTRZCJGSK
Model	BCM450R1	Serial number	lbnrdm-000009
Customer asset ID			

Connectivity problems

This section answers the following question:

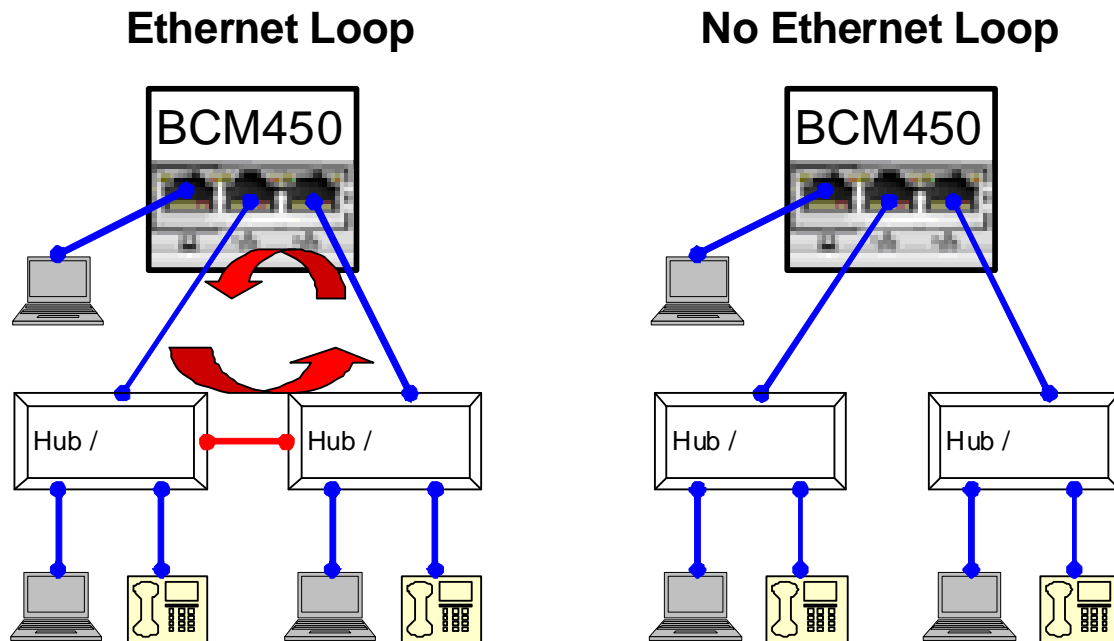
- [What is an Ethernet loop, and how do I avoid creating one?](#) on page 96

What is an Ethernet loop, and how do I avoid creating one?

The BCM450 does not support the Bridging Protocol Data Unit (BPDU), and therefore, you must be careful not to create Ethernet loops in the network while connected to these two ports.

Figure 17 shows an Ethernet loop and how to avoid it.

Figure 17 Ethernet loops



IP addresses

This section answers the following questions:

- [Can I modify the IP address of the OAM port?](#) on page 96
- [What are the default IP addresses of the BCM450 ports?](#) on page 96

Can I modify the IP address of the OAM port?

You cannot change the IP address of the OAM port. You can use Element Manager to view the OAM port parameters.

What are the default IP addresses of the BCM450 ports?

The default addresses of the OAM LAN port are:

- IP address: 10.10.11.1

- Subnet mask: 255.255.255.0

The default addresses of the customer LAN port are:

- IP address: 192.168.2.2
- Subnet mask: 255.255.254.0

Chapter 12

Contacting Technical Support

If you have been unable to resolve an issue using the information and steps provided in this guide, use the information in this chapter to contact Nortel Technical Support. This chapter identifies all of the critical information that you must gather before contacting Nortel Technical Support.

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Gathering critical information

Before contacting Nortel Technical Support, you must gather information that can help the technical support personnel when troubleshooting. This section identifies all the critical information that should be gathered before contacting Nortel Technical Support.

You must attempt to resolve your problem using this troubleshooting guide. Contacting Nortel is a final step taken only when you have been unable to resolve the issue using the information and steps provided in this troubleshooting guide. Gather the following information before contacting Nortel Tech Support. Collecting this information helps Nortel analyze and address the reported issue.

- Problem scenario:
 - Detailed description of the problem
 - Expected Response (how you would expect the system to perform)
 - Actual Response (A detailed account of how the system actually performs)
 - Date and time when the problem started
 - Frequency of the problem
 - Is this a new installation?
 - Can you restore normal operation?
- History:
 - Have you recently changed or upgraded your system, your network, or a custom application? For example, has any configuration or code been changed?
 - What events can be identified prior to the fault: e.g. upgrade, new LAN, increased traffic, new hardware?
 - When were these changes made? Provide the date and time.

- Who made these changes? Were the changes made by a partner or customer? Provide the names of the individuals who made the changes.
- Actions taken:
 - Have you checked that the product's software or firmware is a Current or Sustained Release?
 - Have you checked whether patches or maintenance releases are available that address this issue?
 - You have checked the solutions database for possible solutions (found on <http://www.nortel.com/cs>)?
 - Detailed description of your investigation to date, previous actions taken and outcomes.

Also provide Nortel Technical Support with the following information:

- Provide a full list of patches that you have applied to your system
- Have any additional information available, such as network diagrams, diagnostic/error logs, and configuration files
- Is remote access to the system available?

Getting Help from the Nortel Web site

The best way to get technical support for Nortel products is from the Nortel Technical Support Web site:

<http://www.nortel.com/support>

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. More specifically, the site enables you to:

- download software, documentation, and product bulletins
- search the Technical Support Web site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

Getting help over the phone from a Nortel Solutions Center

If you do not find the information you require on the Nortel Technical Support Web site, and have a Nortel support contract, you can also get help over the phone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following Web site to obtain the phone number for your region:

www.nortel.com/callus

Getting help from a specialist by using an Express Routing Code

To access some Nortel Technical Solutions Centers, you can use an Express Routing Code (ERC) to quickly route your call to a specialist in your Nortel product or service. To locate the ERC for your product or service, go to:

www.nortel.com/erc

Getting help through a Nortel distributor or reseller

If you purchased a service contract for your Nortel product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller.

